AVIATION

The Oldest American Aeronautical Magazine

DECEMBER 29, 1924 Issued Weekly PRICE 10 CENTS

Messenger plane, suspended from airship TC5, prior to being launched from it

VOLUME XVII

NUMBER 26

SPECIAL FEATURES

OUR PLACE IN AVIATION

DETAILS OF THE CURRY BILL

F.B.A.19 AMPHIBIAN FLYING BOAT

ON "A SUGGESTED NATIONAL AIR POLICY"

GARDNER PUBLISHING CO., INC.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

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AVIATION

VOL. XVII. NO. 26

Published every Monday

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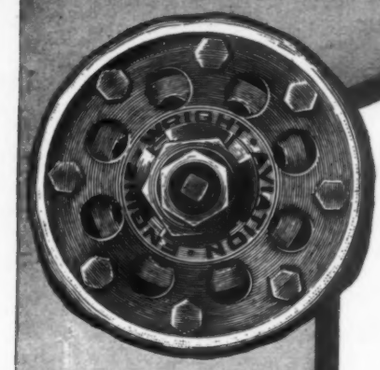

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VOL. XVII DECEMBER 29, 1924 No. 26

The Independent Air Force

IN the Curry Bill, recently introduced in Congress, the proponents and opponents of a separate air force have something concrete to consider. As no legislation of this importance is likely to receive serious consideration at this short session of Congress, the Bill will only serve a useful purpose in stimulating discussion.

In introducing his bill Mr. Curry accompanied it by the following preamble:

"The time has come when the United States must take its place beside other civilized nations of the world in the development of its air power. In the progress of the world nothing offers a greater change in the development of our civilization, due to rapid communication, or in national defense, in the way that the airplane does.

"Today all other first class nations have created Departments of the Air co-equal with their armies and navies and are making aviation a primary consideration instead of regarding it as an appendage of other services. The United States can create the best aeronautical service in the world because we have the best men to man the planes, the best factories, and all the raw material that go into their construction.

"A strong military aviation will guarantee our integrity and independence because an enemy must come to us either through the air or over the water, and air power dominates both.

"This measure will prevent duplication in expenditure and result in the highest efficiency at the least possible cost."

That there is a very strong sentiment outside the Services in favor of centralizing all the air activities of the Government in one Department is evident from the correspondence that comes to AVIATION. Since the Aviation Mission appointed by the President recommended some central department, there has been a constantly growing impression that nothing less than the creation of a separate Department, charged with the responsibility for all governmental aviation, would solve the problems that have confronted this branch of government work.

The Curry Bill has the merit of directness and clarity. It does not straddle. All aeronautical work of the government is placed in charge of a civilian who will sit with the Cabinet. Perhaps this is the most important provision in the Bill. What aviation has lacked is competent and interested direction. Scattered as it has been through all the bureaus, spending large sums of money, directed by ever changing personnel, it is natural that a situation has been created that calls for drastic treatment.

The President stated that the United States was spending about $65,000,000 for its aerial work. This is more than several of the Departments put together. On the basis of expenditures alone, a separate Air Department should receive careful consideration. But the morale of the services is equally important in the discussion. There has been a distinct lowering in this phase of our air work. Naval aviation is not attracting younger officers, while the Air Service of the Army is constantly becoming less satisfied with conditions as they exist. The morale of the Marine Corps has always been the highest in our Services. The reason for this lies in its separate and virtually independent status. A similar condition would probably come about in a separate Air Force. The present mixed lists and shifting personnel have not made for progressive advancement.

Whether or not the present Curry Bill is the best answer to the present situation remains to be considered at hearings. It is at any rate bound to become a storm center when it comes to the hearings.

Speaking of the Navy's "Backbone"

THOSE who can conceive of naval aircraft only as fleet auxiliaries and doubt or deny the potentiality of air power against capital ships, generally base one of their arguments on the fact that naval aircraft have not as yet the requirements that make them self-sufficient on the high seas. Consequently, they say, as bombing or torpedo planes could not engage a fleet of capital ships on the high seas, aircraft should be discounted as offensive factors in naval warfare.

These critics seem to overlook the fact that no important naval engagement in the history of the world has ever been fought very far from shore—see Coronel, the Falklands and Jutland in the last war—and also that the capital ship itself cannot stay away for a very long time from a naval base. In this connection it will come as a shock to the old school of Navy strategists to read what Hector C. Bywater, the well known English naval expert has to say on the subject. It may be remarked that Mr. Bywater is by no means an advocate of air power, but a staunch believer in the battleship "backbone." He writes in the *Baltimore Sun* of Oct. 3, 1924:

"There is something almost pathetic in the utter dependence of the modern battleship on its bases ashore. Unable to stay at sea more than a week or two at a time, its freedom of action is infinitely less than that of the old sailing warship, which could cruise for months on end without touching at a port. The adoption of the Diesel engine in place of steam machinery may double the endurance of the warship of tomorrow, but the base factor will nevertheless continue to dominate every problem of naval strategy."

Mr. Bywater's remarks extend our vista as to how air power can measure its strength with sea power. That a coast well defended by aircraft would be an extremely unhealthy place to approach even for the strongest fleet is hardly disputed since the "bombing exercises" off the Virginia Capes. But it is not so generally realized that one of the most fruitful objectives for bombing airplanes in future wars will be the naval bases of the enemy.

Our Place in Aviation

By MAJOR L. T. JONES
University of California

The author has undertaken to display our statistical information in such form that it will represent quite correctly the present trend of development in aeronautics. A number of authors* have written on the subject of progress in aeronautics but few have given the subject more than merely cursory mention. It seems to be customary to mention the wonderful progress in aeronautical development that was made during the War. Scrutiny of the accompanying figures will indicate that our remarkable progress during the War did not consist in unexpected development of performance of airplanes. It is quite true, however, that progress during the War was rapid and though it fails to show on the curves of Figs. 14, 15, 16, and 17 it is nevertheless present. It consisted in accumulation, classification, and application of the information relating to airplane design. During this period design was placed on a sufficiently firm and exact foundation that we shall never again have an airplane-development experience similar to that encountered in endeavoring to adapt the Bristol fighter to the Liberty motor. It is with some assurance and satisfaction that a designer now predicts performance of his design. A newly designed airplane that will not fly is now almost as rare as a newly constructed boat that fails to float.

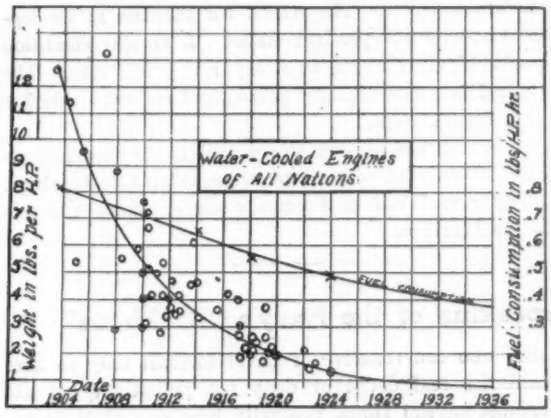


Fig. 1. The specific weight and fuel consumption of water-cooled airplane engines as a fuction of the time in years

A Necessary Survey

In his Wilbur Wright lecture Commander Hunsaker† has summarized in a very able manner information relating to structural details and the relations of parts of airplane structures. He has not treated the subject from the point of view of the present work, nor does the present article deal with the vast amount of information available in structural statistical records. Indeed, it is to be hoped that someone having access to complete airplane records‡ will be detailed to spend the several months that will be necessary to complete the survey that has now been started. It is to be hoped that an elaboration of this work may prove valuable as a guide to future development.

It will be noticed that in a number of figures, such as Fig. 17, the curve drawn passes through the maximum values and does not represent the average value. This must necessarily be true since in Fig. 17, for example, innumerable flights of lower altitude have been made none of which should have any bearing in determining the shape of the maximum altitude curve.

Insufficient time forbids the extension of the present investigation to light planes¶, seaplanes, gliders, and lighter-than-air craft.

It is greatly to be regretted that data published in aeronautical publications are not characterized by the same exactness and reliability that we find in purely scientific work. Indeed, it is by no means the case that optimism in published records of performance is confined to our foreign competitors.

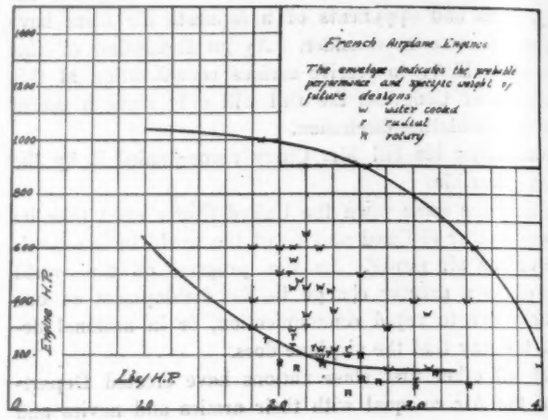


Fig. 2. The horsepower of French airplane engines shown as a function of their weight in pounds per horsepower

Engine Development

The variety of types of aircraft engines that have been designed during the past twenty years constitutes an amazing array. Justification may be lacking, but for the present we shall consider water-cooled engines as typical of past and future aeronautical engine development. Radial and other air-cooled engines may or may not supplant the water-cooled; we shall not enter into a discussion of that. It seems quite probable that the rotary engine will pass quietly out of existence. The reliability, weight, and fuel consumption of water-cooled engines are continually more encouraging. Fig.

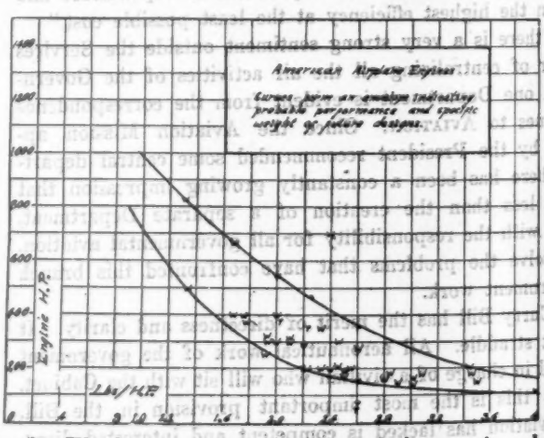

American Airplane Engines
Curves form an envelope indicating probable performance and specific weight of future designs.
Engine H.P.
Lbs/H.P.

Fig. 3. The horsepower of American airplane engines shown as a function of their weight in pounds per horsepower

*Evolution of Aero-Engine Weight: *Aerial Age*, 7, p. 671 (1918).
Present Day Problems in Aeronautics; Stout, *Aerial Age* 7, p. 772.
Hunsaker—*The Aeronautical Journal*, 24, p. 321.
Aeroplanes of Today; Faurote, *Aerial Age* 7, p. 775.
(This list is not intended as complete).

†(ibid.) Appendices 1, 2, 3.

‡Statistical records are kept only privately at present and the more complete records such as those of the U. S. Air Service, Engineering Division, are not available except to Air Service Personnel.

¶See *Illustrierte Flugwecks*, April 2, 1924.

1 shows the chronological development of water-cooled engines of all nations from the Wright Brothers engine of 1903 and its improved models down to those of the present year. The dry-weight of the airplane engine has decreased from 12.7 to 1.3 pounds per horsepower. It is encouraging to see that

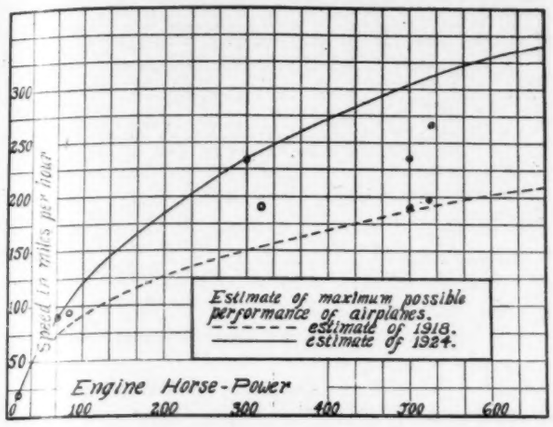

Speed in miles per hour
Engine Horse-Power
Estimate of maximum possible performance of airplanes.
estimate of 1918.
estimate of 1924.

Fig. 4. Estimated maximum possible speed of airplanes as a function of horsepower

during the same time fuel consumption has decreased from 0.8 to less than 0.5 lb./hp. hr. We look forward to 1932 as the time when we shall have passed the 1 lb./hp. mark for weight and decreased the fuel consumption to 0.4 lb./hp. hr. During this period of wonderful development the reliability of engines has continually increased. The points represented by this curve naturally do not include engines for lighter-than-air craft or engines for other than land airplane purposes.

French Engines and American Engines

Fig. 2 and 3 show the relation of horsepower to pounds per horsepower for French and American airplane engines respectively. Points representing water-cooled engines are indicated by *W*, radial by *r*, and rotary by *R*. The two curves drawn form an envelope enclosing the points repre-

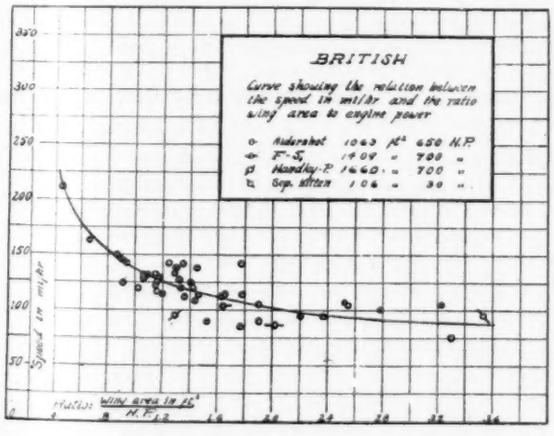

BRITISH
Curve showing the relation between the speed in mi/hr and the ratio wing area to engine power
Speed in mi/hr
Ratio: Wing area in ft²/H.P.

Fig. 5. Speed of British airplanes shown as a function of the wing area per horsepower

senting water-cooled engines. In Fig. 2 the lower curve represents almost exactly the Hispano-Suiza engine, three of the four points on the curve representing engines of that design. The three points on the upper curve of this envelope represent engines due to three different designers. It seems probable that continuation of the excellent Hispano-Suiza design will ultimately lead to an engine of little more than 600 hp. weighing 1 lb./hp. At any rate the envelope indicates that French design will lead to an engine of roughly 600 to 1000 hp. and 1 lb. metal per horsepower.

[1] Stout—*Aerial Age*, 7, p. 772.

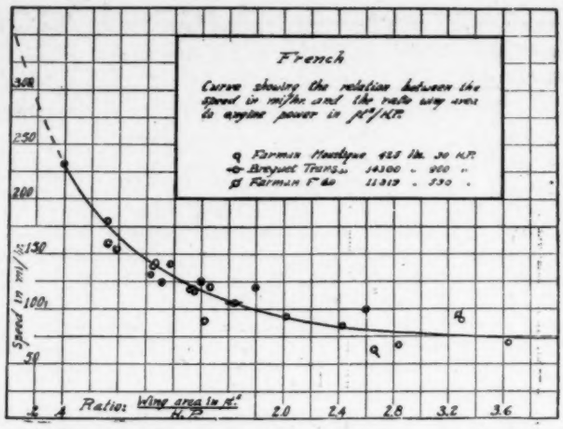

French
Curve showing the relation between the speed in miles and the ratio wing area to engine power in ft²/H.P.
Speed in mi/hr
Ratio: Wing area in ft²/H.P.

Fig. 6. Speed of French airplanes shown as a function of the wing area per horsepower

Fig. 3 representing American water-cooled (*W*) and radial (*r*) engines indicates that American design will lead to an engine of 700 to 1000 hp. and weighing 1 lb./hp. Since most of the lower points of the curve of Fig. 1 represent engines of American design, we are not particularly optimistic in believnig that the American airplane engine will be the first to reach the coveted 1 lb./hp. The relative breadths of the envelopes of Fig. 2 and 3 indicate that the American engine designer has been less temperamental in his creation of types or that the proclivities of our American manufacturers have restricted his imagination. The one lone point of Fig. 3 not lying within the envelope represents the 700 hp., 18-cyl., W-type Air Service engine.

Speed and Horsepower

Our rapid change of judgment in the matter of aeronautical engineering is indicated by Fig. 4 where the dotted curve indicates the maximum possible performance of airplanes as estimated by Stout[1] in 1918. The solid curve represents our present attainments. It is true the solid curve passes through but few points and they the maximum values. There are quite naturally many points lying below the solid curve and even below the dotted curve because our present planes are not designed for speed alone.

Speed, Wing-Area and Horsepower

Figs. 5, 6 and 7 show the relation between airplane speed in miles per hour and the ratio of wing area to horsepower for British, French, and American airplanes respectively. Points are plotted for a considerable number of airplanes regardless of the size or type so long only as they are land planes. It is quite remarkable how nearly the points lie on a smooth curve. If an additional feature such as the landing speed were introduced it is quite possible that the points would

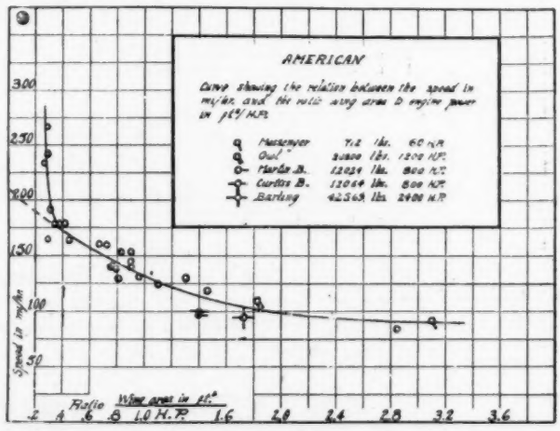

AMERICAN
Curve showing the relation between the speed in miles and the ratio wing area to engine power in ft²/H.P.
Speed in mi/hr
Ratio: Wing area in ft²/H.P.

Fig. 7. Speed of American airplanes shown as a function of the wing area per horsepower

lie much more nearly on the curve. Unfortunately, insufficient data is now at hand. The British and French curves are very much alike. The three curves are almost identical for speeds below 100 mi./hr.

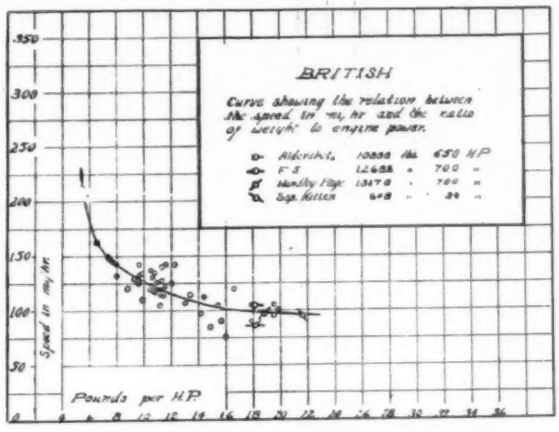

BRITISH
Curve showing the relation between the speed in mi. hr and the ratio of weight to engine power.
Speed in mi. hr.
Pounds per H.P.

Fig. 8. Speed of British airplanes shown as a function of the pounds of airplane per horsepower

The curve of Fig. 7 representing American plane design differs radically from the British and French at the higher points. It indicates that over the speed region of 125 to 175 mi./hr. the American designer has paid too little attention to "cleaning up" the design. There is one feature, however, that does not show on a curve of this nature and yet is a feature of which we are particularly proud. The American designer has in mind, perhaps even uppermost, the thought that whatever be the speed and maneuverability of our fast planes it is equally important that parts should be readily accessible and replacement easy. This frequently causes a slightly more awkward design. It is noticeable in Fig. 7 that the American racers lie on a distinctly separate curve. The present investigation is not sufficiently detailed to indicate whether our racers are lacking in accessibility or whether the first criticism of our slower machines (lack of cleanness of design) is correct. From these same three figures we see that at, for example, 230 mi./hr. both the British and the French are using more wing area per horsepower than the American; the French using 30 per cent greater wing area than we. Since the American engines are lighter, this does not necessarily mean that specific wing loads are less for the British and French. Specific wing loads are not investigated here.

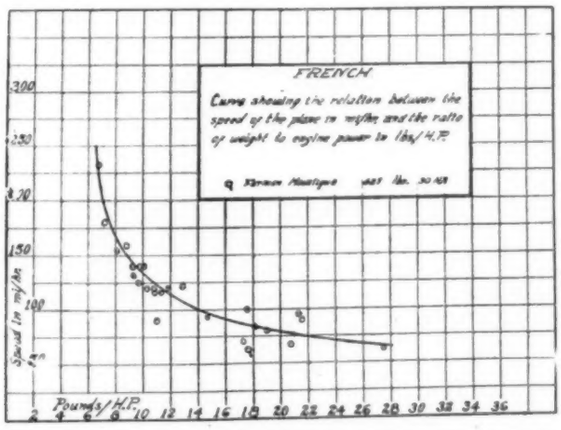

FRENCH
Curve showing the relation between the speed of the plane in miles and the ratio of weight to engine power in lbs/H.P.
Speed in mi/hr.
Pounds/H.P.

Fig. 9. Speed of French airplanes shown as a function of the pounds of airplane per horsepower

Figs. 8, 9 and 10 represent for British, French and American respectively the relation between airplane speed in miles per hour and pounds of airplane per horsepower. Again the points represented include such a wide variety of airplanes

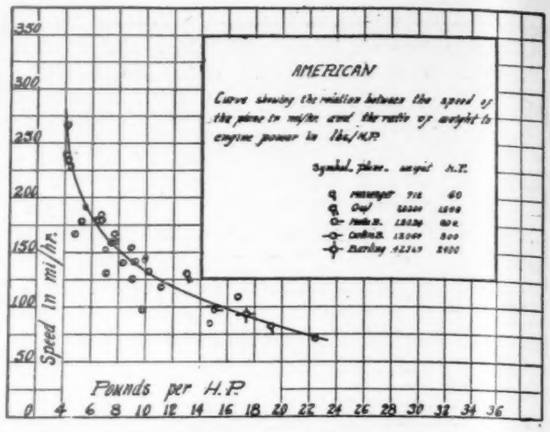

AMERICAN
Curve showing the relation between the speed of the plane in miles and the ratio of weight to engine power in lbs/H.P.
Speed in mi/hr.
Pounds per H.P.

Fig. 10. Speed of American airplanes shown as a function of the pounds of airplane per horsepower

as the Sopwith-Kitten, Moustique, Handley-Page, Owl and Barling. It is well known that the slower planes are built for weight carrying, have large wing area and a consequently strong and therefore heavy wing structure. At the speed of 100 mi./hr. there is not a great difference in specific airplane weight for the three nations. The points represent each plane fully loaded and ready for flight.

Speed and Airplane Weight

On the contrary at 230 mi./hr. the difference between French and American, for example, is little short of startling. Reference to the curves of Fig. 9 and 10 shows that at this speed the French are able to pull through the air 6.8 lb. of airplane per horsepower while the American drives only 4.3 lb./hp. at the same speed. This may indicate either of two things (1) The French airplane offers much less head resistance, or (2) The American airplane is much better in construction. If the American type of structure be the superior of the French the French may be required to use more pounds of material to gain the same necessary strength of structure. If this material be within the fuselage and wing section it would naturally not affect head resistance appreciably but would make the plane heavier. It is very desirable that a sufficient statistical study of American and foreign airplane structures should be undertaken to determine points such as this. Lack of time will forbid the inclusion of such information in this discussion.

Fig. 10 indicates that so long as we use engines of present type or presenting a frontal area similar to those of the present type we shall not be able to reduce the weight of our airplanes much below the indicated asymptotic value of 3.8 lb./hp. or at least not until the specific weight of our engine has been considerably reduced.

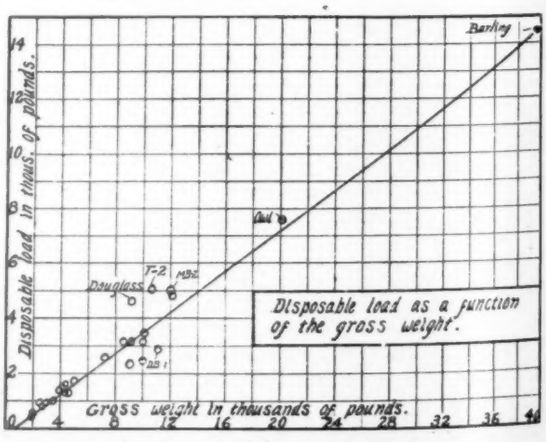


Fig. 11. The disposable load that can be carried by an airplane as a function of the gross weight of the plane

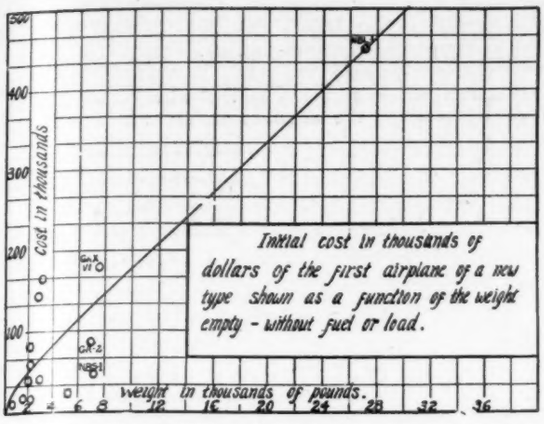

Cost in thousands
Initial cost in thousands of dollars of the first airplane of a new type shown as a function of the weight empty - without fuel or load.
Weight in thousands of pounds.

Fig. 12. The initial cost to produce a single airplane of a type in terms of the weight of the airplane

Large Airplanes

Fig. 11 represents the ratio of disposable load carried to the gross weight of the airplane. It is seen that a straight line represents with marked accuracy this ratio, indicating that the large airplane carries no larger load in per cent of its weight than does the ordinary bombing plane such as the MB2.* (This information disagrees slightly with that contained in Hunsaker's Wilbur Wright lecture.) In Fig. 12 is shown first cost of the first plane of a type plotted as ordinates and the corresponding weight empty as abscissae. The information is very inaccurate and meager. The conditions of construction contracts are not always the same. Parts supplied by the U. S. are not always the same portion of total for all types of planes. A straight line represents the points as well as any curve. Some of the points undoubtedly are production cost instead of single plane cost. Fig. 13 shows cost per hour flown as a function of weight empty of plane. These costs are not entirely trustworthy because of the great disparity between JN4D and DH, for which accurate information is available, and Barling bomber which has been flown but a few hours, (27). Points 1 and 2 on this figure represent airplanes on which experimental changes chargeable to the airplane increased the cost of flying far beyond that of a mere maintenance. The lone point for the DB1 is not considered in drawing the curve for the reason that this airplane has flown but 0.66 hr. Several of the MB2's have flown more than 100 hr. and the cost per hour indicated is reasonably accurate since they are no longer in the experimental class. The necessity and desirability of constructing and testing the Barling bomber before building the special hangar to keep it in led to its being exposed to very severe weather for a long period with consequent rapid depreciation and extensive repairs, some twenty-five thousand dollars labor being necessary to recondition it.

*Note. The actual gross weight of the Barling in 42,569 lb. and disposable load 15,437 lb.

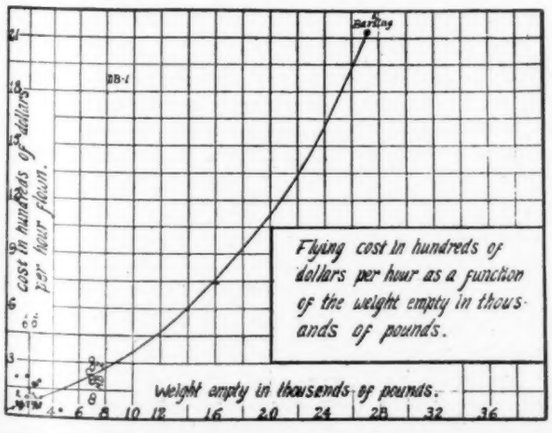

Barling
DB-1
Cost in hundreds of dollars per hour flown.
Flying cost in hundreds of dollars per hour as a function of the weight empty in thousands of pounds.
Weight empty in thousands of pounds.

Fig. 13. The cost of flying an airplane, including overhead and other operating expense

Figs. 11, 12 and 13 seem to indicate that the Barling exceeds suitability in size. While the shape of the curve of Fig. 13 indicates that very large airplanes increase the cost of transporting a given load the shape of this curve might differ radically under war conditions.

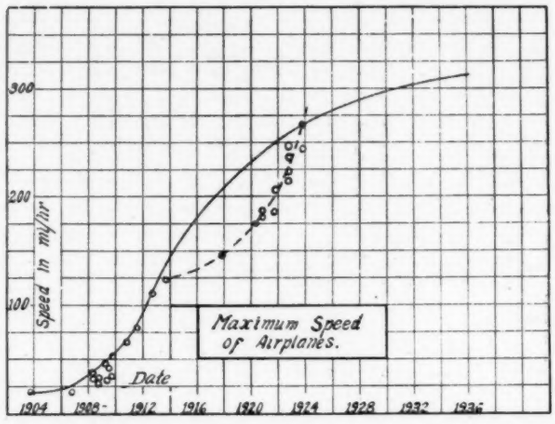


Fig. 14. The maximum speed of airplanes and the year of the performance. Points are plotted for some authentic performances although the record may be not allowed as world record

Future Performance of Racing Airplanes

Fig. 1 indicates that the year 1932 will see airplane engines approximating the weight 0.8 lb./hp. and the indications are that this is probably the minimum weight that will be attained for engines constructed along the present principles. The R2C1 has a speed of about 250 mi./hr. when equipped with the engine of 500 hp. weighing 671 lb. (dry weight). As indicated in Fig. 3 we may hope to have in 1932 an engine of 840 hp. weighing but 670 lb. Since the 1932 engine weighs the same as that used at present let us assume that it is not necessary to make any alterations in the plane that will affect its equivalent flat plate resistance. Assuming validity of the usual laws we may write

$$\text{Hp. (1924)} = kSV_1^3$$
$$\text{Hp. (1932)} = kSV_2^3$$

and from the preceding values of hp. derive

$$V_2 = 1.20\ V_1$$

The racer of 1932 will have a speed approximating 1.20 that of the R2C1 or about 300 mi./hr. if present methods of construction be continued.

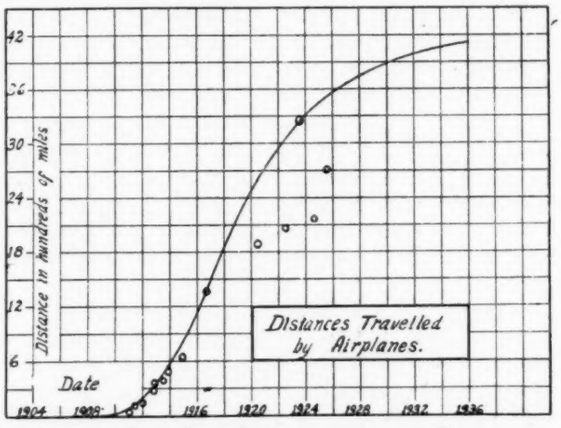


Fig. 15. A chronological representation of distance records of airplanes of all nations

Fig. 14 shows graphically how the maximum speed of air-

planes has increased during the past two decades. It is noticeable that during the War period, 1914-1919, the maximum speed of airplanes fell behind expectations. The years 1919-1924 show intense activity and instead of representing the values by the solid curve it is quite possible that we should really represent them by the dotted curve. The writer inclines

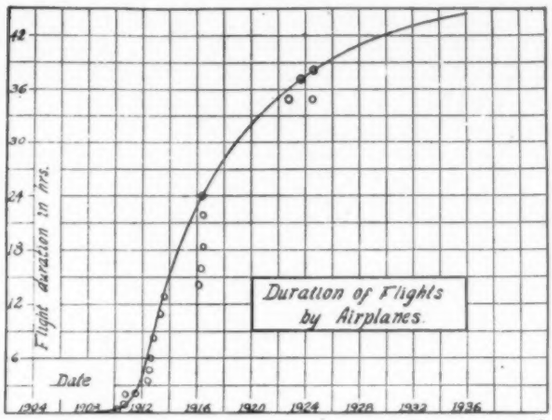


Fig. 16. A chronological representation of record duration flights by airplanes of all nations

to the belief that the solid curve is the more nearly correct representation. Funds for the construction of racers are very limited. There seem to be none under construction at present. This curve also indicates that the year 1932 will see racing planes of speed beyond 300 mi./hr., the asymptotic value being about 325 mi./hr.

Fig. 15 and 16 show respectively distances travelled and duration of flights by airplanes. Comment need not be extended beyond saying that a reduction in specific fuel consumption from 0.5 to 0.4 lb./hp. hr. which Fig. 1 indicates will be effected by 1923 will result in approximately 20 per cent greater distance of travel and duration of flight.

The refueling of the airplane in the air which was ac-

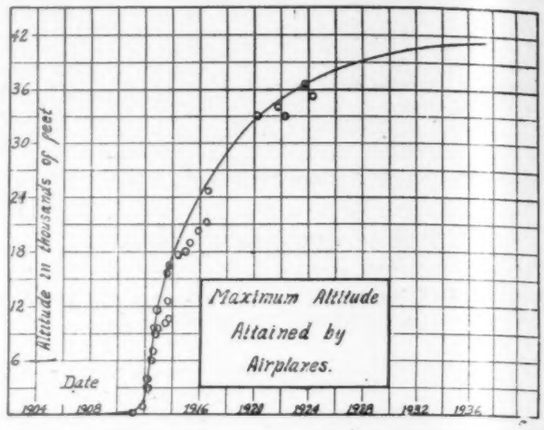


Fig. 17. A chronological representation of maximum altitudes attained by airplanes of all nations

complished so successfully by Smith and Richter may lead to distances limited only by endurance of pilot and engine.

The maximum altitude attainable, Fig. 17, is limited by the physique of the pilot as well as by the airplane and engine. The difficulties of extreme altitude flying make it quite apparent that during the next war if battle is to be staged at such altitudes it will be a duel between Lecointe and Macready.

Navy Approves N. A. C. A. Aircraft Policy

The Navy Department is in complete accord with the recommendations made by the National Advisory Committee for Aeronautics with regard to stabilizing the aircraft industry, it is officially stated. The Navy Department's policy with regard to procurement of aircraft has been well established. This policy is based on the types of aircraft determined upon by the General Board. For service with the Fleet the Navy requires Fighting airplanes for combat, Observation planes for spotting gun-fire, Scouting-Torpedo-Bombing planes for reconnaissance and offensive work against equal surface craft, patrol planes for patrolling the coastal areas, and Training planes for training.

In each of these types there are a number of different designs of aircraft available. The Department has long appreciated the necessity for standardizing upon a single design for each of the above types. It has been necessary, however, to conduct exhaustive service tests with a view to determining which design to standardize. These tests have progressed to a point where this can now be done.

In the Fighting class, there are the TS and the VE7 now in service. In the Observation class, there is the UO1. This has proved to be a most satisfactory observation airplane, having been used with greatest success by the scout cruisers cooperating in Greenland with the Round-the-World fliers. The Scouting-Torpedo-Bombing planes have been combined in a single three purpose design. This is the CS which now holds the unofficial endurance record. In the Patrol type, the PN7 is an experimental development. Two of these airplanes established new world's records at the Air Pageant at Baltimore. In the training type, the Boeing Training Plane has been standardized. All of the above aircraft are powered with the new Wright engines, the smaller craft using the Model J (Whirlwind) aircooled engine and the larger craft using the Model T (Tornado) watercooled engine.

Of the above aircraft, there are sufficient of the TS and VE7's now on order. A considerable number of UO1's have already been delivered, more are on order, and still more are contemplated. These aircraft are being purchased judiciously with a view to stabilizing their manufacture. A number of the CS design are now on order and an equal number are scheduled for purchase at the proper time. A large number of training planes are on order and about to be delivered. Others will be delivered as necessary. From this, it will be seen that the Navy Department is already carrying out the recommendations contained in the National Advisory Committee's excellent report.

From the foregoing statement, it must not be construed that progress in aircraft development will be stopped through the standardization of the listed types. A very active experimental program is being pursued. A new and improved experimental airplane is under construction or contemplated in each of the types specified by the General Board. In general, the Department's policy will be to build two or three of the experimental airplanes for test purposes. If they prove satisfactory, a number will be ordered and shipped to the service units for service tests. If the new design is so far superior to the old design as to warrant a strong demand from the operating units for the new design, then the Department will standardize on this design. Inasmuch as the development of a new type is a matter of some two years, it will be possible for the Department to continue to purchase the standard design in sufficient quantities for its use over a comparatively long period.

It is believed that strict adherence to the principle of not replacing a standard design until an experimental design has been definitely demonstrated to the operating units will materially standardize the procurement problem. This problem has, in the past, been complicated by the fluidity in aircraft development. Now that an opportunity has arrived to stabilize construction, the Navy Department's policy is to stabilize the procurement of proved types and to maintain at the same time active competition from experimental types.

On "A Suggested National Air Policy"

By MAJ. W. D. TIPTON

The air policy which appears in each issue of AVIATION, and which has been subject to weekly additions in theory, but sometimes subtractions in fact, is thought along the right line. On the theory that human effort should have a goal that it will never completely attain, this goal which is suggested and augmented weekly, is a real necessity. At least all will agree that we get nowhere rapidly by having nowhere to go.

How to Break Cannonballs

The policy outlined suggests first one thing—a frontal attack against all those ills which beset aviation. It reminds one of the story of the man who tried to break cannonballs with a sledge but who found that it was much easier to fill them with water and let nature plus a cold night do the trick. This parallel might well be applied to aviation. The motif of this policy is "encouragement." The chief encourager seems to be the government run in the main by the "wise men who sit on the Hill" and to them, "Encouragement" when supplied by Uncle Sam, is spelled with thirteen dollar marks.

As to the cannonball story, the "continuing development" wished for is restrained by public lethargy which results from fear. As to the transportation end of this development, no amount of "pep" talk, hot shot editorials, wise sayings on the subject of aviation put in the mouth, or rather in the ink, of public men, by effervescent publicity men, is going to herd the public into airplanes while they still believe their necks are in danger, and in particular, when they recollect the aviation clause in their insurance policies.

Boring from Within Suggested

One suggests the "boring from within" rather than the frontal attack policy. The public must live with aviation, must see flying done without too many accidents, must see it enter its daily life, in short must realize its service before it will become enthusiastic. The Air Mail, rapid delivery of pictures, skywriting, aerial mapping service, aerial photography, night air advertising—these are the things that the public is living with. They are standing on their own feet and paying their way and their encouragement is merited because they render service which can be appreciated. The gypsy flier, much maligned in International Air Congresses by the right-thinking, has in spite of the sometimes merited abuse heaped on his head, been a factor in bringing flying to the people. Incidentally it is somewhat amusing to see the gypsy flier, after having been lambasted all over the lot, being clasped to the bosom of the "élite aéronautique" and hailed as a brother in arms. One believes that no amount of pushing and pulling is going to make aviation move any faster than public demand for its services, and of all these services transportation of human beings is going to be the last accepted.

Right now the Air Mail is as popular with the public as the Washington baseball team, and this popularity is going to grow with the appearance of those red, white and blue air mail boxes which verily bring aviation to the man in the street. Some day, after the Post Office Department laboratory is satisfied as to the proper way to do it, the air mail will be carried by contracting air transport companies. A definite service will then be rendered, which can be felt by the public, and after seeing how fast his letters travel, and how safely, the business man will begin to send himself by the planes that carry his mail.

Who Travels by Air

Almost every attempt to provide air transportation for humans has been met with the fact that it will not pay unless supported by subsidies. The load in sufficient quantity is not there to make the service pay. No need to point to the European services subsidized for political reasons. The psychology of European travel where one travels between the capitals of great nations, between nations and colonies, makes for a certain amount of high pressure travel, but nevertheless not enough to sustain the service. And after all who would not spend forty dollars to get out of a London fog in a hurry to spend a night in Paris.

One believes that in spite of the slowly growing European air travel, not one fraction of those who should fly as a business proposition do so. Sitting far away from the scene, and not having seen a DH34 get off from Croydon, one venturps the opinion that European traffic is made up for the most part of drawing room air travelers, who like to be able to say they have done it.

Agreeing on What is Wanted

Now for the "air policy." First, "a continuing policy of development....." This is vague enough to head any list. "Aircraft committees in the House and Senate to hold aircraft hearings where civilians as well as government officials can express their opinions." In the first place, if Congressman Nelson *et al.* have their way aviation is going to be on the floor of the House with both feet whether the right-thinkers want it or not. In the second place, the Congressional Record is considerably cluttered up with people expressing their opinions on aviation, few of them agreeing. Before aviation is taken before Congress, how about agreeing on what is wanted. One has it from reliable sources that the Winslow Bill is still a bill because the doctors disagreed. "An experienced staff of flying officers at the head of all governmental air defense services." One suggests that the proponent of this idea stroll through the Office of the Chief of the Air Service, Army, or of the Chief of the Bureau of Aeronautics, Navy Department, and look over a few manly bosoms. One thought we were well past this milestone.

On the subject of coordination of experimental and procurement service under one head, the suggestion in italics is much the better. One procurement service, no competition. Perfectly good manufacturers are left subject to the temperament of one man. Much better have two. As to the limitation of government construction, certainly the government should keep out of aircraft building. When the government goes into business, costs go up.

The Aerial Policeman

"The elimination of duplication of aerial functions by government departments." The Army and Navy are now about to lock horns as to which shall supply our coast air defense. A sprightly Congressional word battle on the subject is promised. "A country wide air mail system ...." May one add, eventually flown by private enterprise. "A national aircraft law that will regulate aviation ....." Fine, but who added, "and federal air police?" If there is anything funnier than an air policeman, it is two air policemen. The last two items in italics need liver pills. "Increased governmental appropriations." A muchly overworked, but little heeded cry of "wolf." A better suggestion is to make the money appropriated go a bit further. AVIATION has been hitting the ball on this subject.

Under the heading "Commercial Aircraft Operation" we see three loud calls for encouragement, two for creation and one for a continuing organization. The first two items mentioned above depend upon the support of the public in the final analysis, and this is to be obtained by gradually showing the public how aviation can be used. One does not believe mammoth air races help greatly. High speed, high altitudes and the superlatives of flying scare the average man. Two hundred and sixty-six miles an hour,—"Not for mine," he says. Or, 36,000 ft.,—"My, it must be cold up there," he shivers. Far better, one suggests, events like the King's Cup in Great Britain, or the late light plane contests in England and France. Anything to draw the public and aviation closer together. International speed contests between, may we sug-

gest, governmental air services, are fine and make for development. Look what the Pulitzer Race has meant for American aviation. They are, however, stressed too highly. The big idea has been speed and more of it.

Against Too Much Centralization

The suggestions about landing fields, aero clubs, design competitions, commercial operators and manufacturer's associations, research, are all fine. One would like to take exception to the matter of unifying all aeronautical organizations into one national body. A certain amount of national direction is all right, but this business of trying to run things from Washington will not work—witness the first year of life of the National Aeronautic Association. It must have been a nightmare for the angels. Far better a spontaneous growth such as we see in many of the smaller cities. Some outsider comes to your city, makes a speech and forms a chapter. A few of the faithful sign on the dotted line. This chapter was created by outside influence. It had nothing spontaneous about it, no strong feeling within itself that there was a need for such an organization in that particular city, and it pines away. This is another example of the frontal attack and there are many of them.

The idea of all this can be generally summed up by that old saying about the drinking trough and the reluctant horse. All this development, encouragement, creation, etc. is going to come gradually as the public grasps the idea. People cannot be talked into the use of airplanes, particularly in their present state of information. The average man will talk to the pilot about the spectacular features of flying. He still considers it a side show, and too often his informant leaves an impression meriting this idea. The ignorance of the average man, even the business man who will be the real user of air services, is appalling, and until a policy of enlightenment by aircraft performance which demonstrates a reason why he should use it, is adopted, we are getting nowhere rapidly, by adopting vague policies which we do not understand fully ourselves and which mean less to the public.

Census of Aircraft Manufactures, 1923

The Department of Commerce announces that, according to data collected at the biennial census of manufacturers, 1923. the establishments engaged primarily in the manufacture of aircraft produced 505 airplanes valued at $6,166,218 and 82 seaplanes and flying boats valued at $1,570,851, together with other products to the value of $5,208,194, making a total of $12,945,263. The rate of increase in this total as compared with 1921, the last preceding census year, was 94.9 per cent.

New German "motor-glider," built by the Steinfurth firm of Koenigsberg and fitted with a 4 hp. Siemens engine. German light plane builders favor extremely low powered ships as a rule

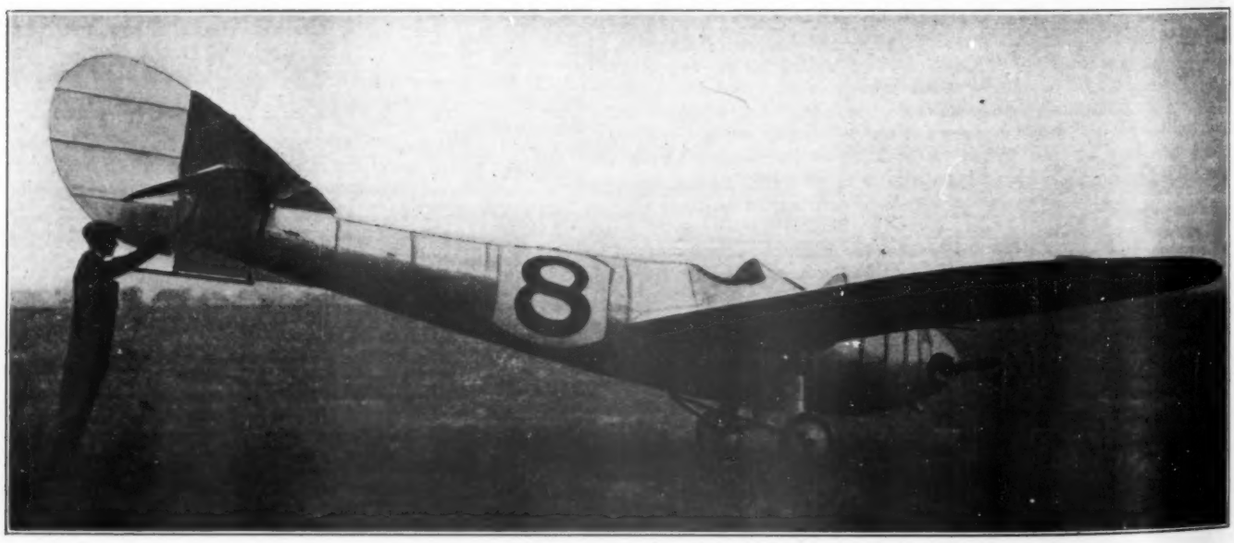
In addition, airplanes, seaplanes, and parts were made to some extent by establishments engaged primarily in other industries. The value of such planes and parts thus produced outside the industry proper in 1921 was $777,843, an amount equal to 11.7 per cent of the total value of products reported for the aircraft industry. The corresponding value for 1923 has not yet been ascertained, but will be shown in the final reports of the present census.

Of the thirty-three establishments reporting for 1923, twelve were located in New York, four each in California and Ohio, three in Illinois, and the remaining ten in Connecticut, Maryland, Michigan, Nebraska, New Jersey, Pennsylvania, Rhode Island, Washington, and Wisconsin.

The statistics for 1923 and 1921 are summarized in the statement below. The figures for 1923 are preliminary and subject to such correction as may be found necessary upon further examination of the returns.

	1923	1921	Per cent of increase*
Number of establishments	33	21	....
Wage earners (average number)†	2,901	1,395	108.0
Maximum month	Jan. 3,108	Apr. 1,636	....
Minimum month	Dec. 2,373	Oct. 1,160	....
Per cent of maximum	76.4	70.9	....
Wages	$4,521,949	$2,202,307	105.3
Paid for contract work	$149,464	$1,324	11188.8
Cost of materials (including fuel and containers)	$3,829,574	$2,407,395	59.1
Products, total value	$12,945,263	$6,641,988	94.9
Airplanes:			
Number	505‡	290	74.1
Value	$6,166,218‡	$3,818,340	61.5
Seaplanes and flying boats:			
Number	82	9	....
Value	$1,570,851	$310,568	405.8
All other products, value	$5,208,194	$2,513,080	107.2
Value added by manufacture¶	$9,115,689	$4,234,593	115.3
Horsepower	5,443	§	....
Coal consumed (tons of 2,000 lb.)	10,042	§	....

*Per cent not computed where base is less than 100.
†Not including salaried employees and proprietors and firm members. Statistics for these classes will be given in final report.
‡Includes 113 remodeled airplanes, valued at $193,315.
§Total value of products less cost of materials.
¶Not reported.

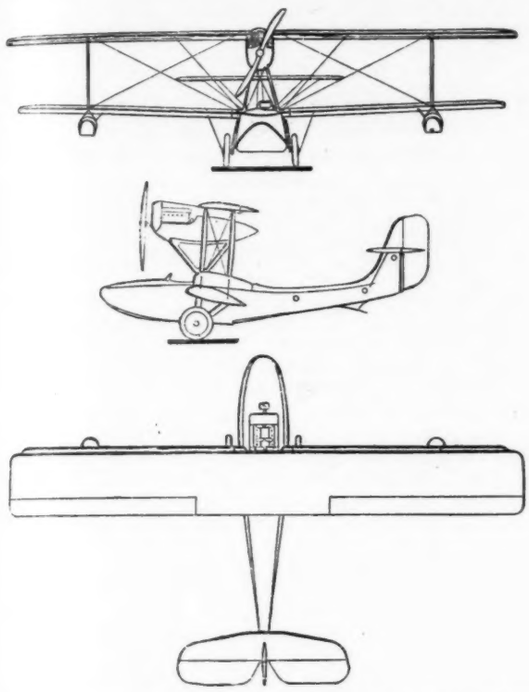


The Short Satellite two-place light monoplane (Bristol Cherub engine) entered in the Lympne competition. The fuselage has a sheet duralumin skin which is riveted to bulkheads of the same material. The wings are of wood and fabric

The F.B.A. 19 Amphibian Flying Boat

Those who follow the development of French aeronautics will remember that the Schreck F.B.A. 17 amphibian flying boat was entered in this year's competition for French touring planes, and that it performed most creditably throughout this cross-country event. The F.B.A. model 19 amphibian, with 300 hp. Hispano-Suiza engine, which forms the subject of this description, is directly derived from the earlier amphibian of this firm which was fitted with a 180 hp. Hispano.

The F.B.A. 19 was primarily designed for commerical purposes, that is, for the carrying of mails or passengers on



Outline drawings of the F.B.A.19 (300 hp. Hispano-Suiza) flying boat amphibian

rivers, lakes and coastal routes. However, with a view to adapting the ship to naval patrol work, the seats of the pilot and the passenger are so arranged with respect to the wings that machine guns can be mounted on both cockpits for defense against pursuit ships.

The new ship has already four new world records to its credit, as follows:

Altitude with Useful Loads of 250 and 500 kg.—4755m. Made by F. Laporte at Argenteuil, France, Aug. 27, 1924.

Speed with Useful Load of 500 kg.—142.1 km./hr. over 100 km. distance; 141.9 km./hr. over 200 km. distance. Made by Emile Paumier at Argenteuil, Nov. 30, 1924.

Wings and Hull

The F.B.A. 19 flying boat is a biplane with a surface of 493 sq. ft. The upper wing is made in two pieces, the span being 47 ft. 4 in. and the chord 5 ft. 10 in. The wing is rectangular in form. The lower wing has a slightly greater chord and is also built in two pieces which are fitted into the hull. The lower wing has a dihedral of 2½ deg.

Ailerons are fitted only to the upper wings and are unbalanced. They are operated through rigid control rods, and are 17 ft. 8 in. long and 1 ft, 8 in. deep.

The wings are braced by a single set of struts on each side of the fuselage, lift wires running from the hull to the struts and also to the center of the wing panel. The wings are joined at the center by a system of steel tubes which also form the motor support and are braced to the hull.

The hull which has very good lines is flat at the forward part of the bottom, but has a slight V toward the rear. The deck is of plywood, while the sides are of veneer. The bottom is also of veneer, but of triple thickness at the step. Bulkheads divide the hull into several water tight compartments. A special type of porthole gives access to each of these.

The pilot is placed in front of the wings while the passenger is placed directly behind the wings. The lower wings are slightly cut out for better visibility and for greater ease in getting in. In case the machine is to be put to military use, a Lewis machine gun is mounted on the pilot's cockpit and a gun ring is fitted in the rear cockpit.

The rear of the hull is swept up to keep the control surfaces clear of the water. The rudder and the elevator, built as a single panel, are unbalanced. All control leads are rigid. The wing tip pontoons are placed directly under the struts.

Power Plant

The ship can be fitted either with a 300 hp. 8 cylinder Hispano Suiza or with a 12 cyl. motor of the same make giving 350 hp. A two bladed propeller of 9 ft. 3 in. diameter is used. A Letombe compressed air starter serves to crank the motor.

Gasoline is supplied by two pumps. A honeycomb radiator is placed in front of the motor. The engine nacelle is well streamlined by a plywood cowling which is reinforced by metal on the inside. The engine is supported on each side by two vertical plywood panels and two metal struts which start from the bottom of the forward wooden strut. One of the struts runs to the front of the engine mounting and one to the top of the rear strut, thus forming three triangles. The engine bed is further braced to the upper wing by a number of steel tubes.

The Landing Gear

The landing gear is composed of Vee struts on each side of the hull, the tops of which are hinged onto the front and rear wing beams. The wheels are fixed directly to the bottom of the struts and landing shocks are taken up solely by oversized tires. When the landing gear is swung down it fastens into the sockets of an axle which runs through the hull. The wheel hubs and the axle are notched in such a fashion that when the notch in the axle is turned it locks into the notch on the wheels.

Swinging the landing gear to a raised position under the wings is accomplished by a cable which is fastened to the wheels and to the point in the wing which the wheels reach when they are lifted. The cable is operated by means of a hand wheel from the pilot's seat. An auxiliary wheel is provided in the passenger's cockpit. Raising the wheels requires 12 sec. and lowering them 2 sec. A special gear prevents the mechanism from being reversed while the wheels are raised, but these can be dropped instantaneously when desired. A lever controls this gear.

The tail skid consists of a number of leaf springs set in a duralumin housing which can easily be removed by undoing a few bolts. The landing gear is also quickly demountable so that the plane can easily be changed from an amphibian into a normal flying boat. The parts which are not easily detachable weigh 40 lb.

SPECIFICATION OF THE F.B.A. 19 AMPHIBIAN

300 hp. Hispano-Suiza Engine

Span, upper	47 ft. 4 in.	Power loading	14 lb./hp.
Span, lower	45 ft. 4 in.	Safety factor	8.
Length	31 ft.	High speed	106 mi./hr.
Height	12 ft. 6 in.	Low speed	53 mi./hr.
Area	493 sq. ft.	Take off on water	14 sec.
Weight empty	2926 lb.	Take off on land	10 sec.
Useful load	1250 lb.	Climb in 12 min.	6560 ft.
Total weight	4176 lb.	Climb in 20 min.	9840 ft.
Wing loading	8.3 lb./sq. ft.	Ceiling	18,000 ft.

Airplanes Aid Spanish Revolt

Airplanes carrying full cargoes of Republican propaganda against King Alfonso of Spain recently flew over San Sebastian, Burgos, Pampeluna, Vera and Barcelona and succeeded in dropping several thousand copies over these cities. One of the planes was labeled in huge letters on the wings, visible from the ground, "Republic of Spain" and the other "Liberty."

The Spanish government has issued instructions to shoot down any plane not carrying recognized identification marks.

The Curry Bill

On December 3 Representative Charles F. Curry of California introduced in Congress a Bill to create a Department of Aeronautics, a United States Air Force, and a bureau for the control of Civil Aviation, the whole to be headed by a Secretary who automatically would become a member of the Cabinet. A copy of the Bill known as H. R. 10147 may be had on application to Mr. Curry.

The administrative personnel of the Department is a Secretary, with a salary of $12,000, an Assistant Secretary at $6,000, a chief clerk at $3,500 with the usual organization of clerks, inspectors, and special agents.

The province of the Department of Aeronautics is to "foster, develop, and promote all matters pertaining to aeronautics, including the collection and dissemination of information relating thereto, and it shall be charged with the purchase, manufacture, maintenance, and production of all aircraft for the United States, and shall perform all duties heretofore assigned to the War, Post Office, Navy and Treasury Departments, or any other department of the Government, except as may be hereinafter provided, in times of peace and war in so far as they relate to aviation, which shall include the supply of personnel and equipment for air mail routes, the responsibility for aerial defense, the preparation of aerial photographs, and the granting of aviators' and aeronauts' licences to civilian pilots and all other pilots, and the promulgation of rules and regulations to govern such aviators and aeronauts; the issuance of licences for airships, airplanes, hydroairplanes, seaplanes, balloons, dirigibles and many and all other aircraft, the promulgation of rules and regulations governing the international, interstate and intrastate flying: the supervision and establishment of aerial landing fields, including the supervision of those used for private or commercial purposes, the preparation and distribution of meteorological data; the furnishing of personnel and equipment for coast, border and forest reserve patrol for any other department: the supply of personnel, the instruction, training and equipping of air forces for the national defense and the development of heavier and lighter than air aeronautical material, and fostering such development for commercial purposes; to establish and maintain an aeronautical academy or academies, and such aircraft factories as may be hereafter authorized by law; and to this end, it shall be vested with jurisdiction and control of departments, bureaus, offices, and branches of the public service hereinafter specified."

There is a sharp division in the Bill for military and civilian air activities. The civilian matters would be supervised by the Division of Civil and Commercial Aeronautics, the head of which would be appointed by the President. The Division of Supplies and the Division of Research would be headed by civilians, also appointed by the President.

The regulations for civilian flying, aircraft, airdromes and airways are vested in the Department in general terms.

The Bill abolishes the National Advisory Committee for Aeronautics. It provides for air attachés at our foreign Embassies. It creates an Air Force Medal of Honor, a Flying Cross and a Distinguished Flying Medal.

The Department of Aeronautics is specifically charged with the aerial defenses of the United States and its possessions. This includes such anti-aircraft provision as may be required. The military branch of the Department known as the United States Air Force, is to be headed by a Marshall with the rank corresponding to that of a Major General in the Army or a Rear Admiral of the Navy. Other rank titles for air officers are Brigade Marshal, Colonel, Commander, Lieutenant Commander, Captain, Lieutenant and Ensign. The Air Force would have the usual Line and Staff officers. A Reserve Air Force and National Guard Air Force are also provided for. The head of the Air Force is to be the military advisor to the Secretary of Aeronautics.

The line of the Air Force is to consist of brigades, wings, groups and squadrons, while the staff consists of an operations division, an administration division, a supply division, an engineering division, a medical division, a legal division and such other divisions as may further be required.

Two thousand officers and twenty thousand enlisted men are set as the limits of the proposed U. S. Air Force. Other provisions of the Bill which covers fifty printed pages provides for the assignment of units; the transfer of funds; the acquiring by transfer and appointment of the personnel, civilians and officers of the Department; a constitution of the personnel; retirement regulations; promotion regulations; limitations of the jurisdiction of the Department; a statement of the legal status of aircraft; enforcement provisions and the status of the act after passage.

As no funds are provided for by the Bill except by transfer, an appropriation bill would be required to put its provisions into effect.

The Curry Bill represents the latest effort in the direction of a separate or independent air force and, as such, will require careful study by all who have believed that this change is necessary for the adequate development of our air power.

Government Bids and Awards

Air Service Awards

The following awards have been made by the Chief of Air Service under the dates indicated:

Miscellaneous Parts and Accessories—Avon Tool & Machine Co., Dayton, Ohio, item 14, 100 fuel pump drive assemblies, $31.50; 7a, 250 fuel cock assemblies, $9.25; 11a, 850 fuel pump assemblies, $10.20.

Eberhart Steel Products Co., Inc., Buffalo, N. Y., item 15, 100 flexible drive shaft assemblies, $8.75; 6, 275 fuel cock control universal joints, 77c.

Pollak Mfg. Co., Arlington, N. J., item 1, 650 fuel tank filler units, $2.33.

Morgan Mfg. Co., Keene, N. H., item 3a. 325 fuel cock assemblies, $1.85; 8a, 500 fuel relief valve assemblies, $2.40.

National Steel Products Co., Dayton, Ohio, item 4a, 435 fuel cock control handle and indicator plate assemblies, $1.20; 5, 225 fuel cock control yoke drivers, 35c; 9a, 300 handle and indicator assemblies, fuel cock control, $1.20; 10a, 250 fuel cock assemblies, $8.

Items 2, clock mounting assemblies, and 12, 125 unit sight mount clamps, canceled. (Nov. 10, 1924).

Meisel Press Mfg. Co., Boston, remodeling 500 standard Liberty-12 oil pumps, $17.

G. Elias & Bro., 1,500 oil pump driving shafts, $1.68: 1,000 do, $1.83. (Nov. 25, 1924).

Chas. Cory & Son, New York City, 200 sets running lights, $9.90. (Nov. 17, 1924).

The Goodyear Tire & Rubber Co., Akron, Ohio, 3 pontoons, $184.85; 2 pontoon assemblies, $117; 8 airship car clevises, $3.85. (Nov. 17, 1924).

Dope—Titanine, Inc., Union, N. J., item 2, 2,000 gal. airship and balloon dope, $1.395; 6, 4,000 gal. yellow pigmented nitrate dope, $1.625.

Perry-Austin Mfg. Co., Grasmere, S. I., item 4, alt., 50,000 gal. cellulose acetate airplane dope, $1.142.

E. I. du Pont de Nemours & Co., Parlin, N. J., item 5, 5,000 gal. pigmented nitrate dope, o. d. color. (Nov. 10, 1924).

Negative Preservers—White-Corbin Co., Rockville, Conn., item 14, 10,000 negative preservers, 8½ x 10½ in., manila, $7.41.

Union Envelope Co., Richmond, Va., 2,500 do, 21 x 25 in., $40. (Nov. 10, 1924).

Navy Department Awards

The following awards have been made by the Navy Department under the date indicated:

Reconditioning Airfoils—Curtiss Aeroplane & Motor Co., Inc., Garden City, N. Y., reconditioning airplane airfoils, $63,626.75. (Nov. 14, 1924).

—The other bidders were:

Cox-Klemin Aircraft Corp., Baldwin, L. I., N. Y., $69,980.

Huff, Daland & Co., Ogdensburg, N. Y., $97,200 and $75,200.

Radiators—Rome-Turney Radiator Co., Rome, N. Y., type G radiators, $8,791. (Dec. 1, 1924).

Exhaust Pipes—Wright Aeronautical Corp., Paterson, N. J., exhaust pipe, J1 engines, $776.50.

Propellers—Aeromarine Plane & Motor Co., Inc., Keyport, N. J., class 1, aircraft propellers, $885.30 ea.

Hamilton Mfg. Co., 37 Erie St., Milwaukee, Wis., class 2, propellers, $171 ea. (Nov. 20, 1924).

Hamilton Mfg. Co., Milwaukee, Wis., propellers, $121 ea.; total, $1,452. (Nov. 21, 1924).

Bids Received

The following bids were received by the Navy Department, Dec. 1, 1924:

Single-Seater Airplanes—Item 1, 10 VF single-seater airplanes; 2, 2 VF do; 3, 1 do; 4, 1 do; 5, 3 water type landing gears; 6, 1 VF experimental single-seater airplane:

Boeing Airplane Co., Georgetown Station, Seattle, Wash., item 1a, $14,000 ea.; lb., $1,000; 1c, $1,000; 1d, $3,000; 1e, $35,000; 2a, $19,050 ea.; 2b, $1,500; 2c, $1,500; 2d, $3,000; 3a, $20,000; 3b, $2,000; 3c, $2,000; 3d, $3,000; 4a, $19,000; 4b, $1,000; 4c, $1,000; 4d, $3,000; 5a, $4,000 ea.; 5b, $5; 5c, $500; 5d, $1,000; 6a., $30,000; 6b, $5,000; 6c, $2,000; 6d, $3,000.

Cox-Klemin Aircraft Corp., Baldwin, L. I., item 1a, $14,000 ea.; lb., $4,000; 1c, $1,000; 1d, $5,000; 1e, $36,000; 2a, $14,200 ea; 2b, $500; 2c, $100; 2d, $1,000; 3a, $17,500, with items 1 and 2 $16,500; 3b, $3,000, with items 1 and 2 $1,000; 3c, $500; 3d, $4,000, with items 1 and 2 4,000; 4a, $17,500; 4b, $1,000; 4c, $500; 4d, $1,000; 5a, $4,000 ea.; 5b, $800; 5c, $200; 5d, $1,000; 6a, $17,500, with items 1 and 2 $16,500; 6b, $1,000; 6c, $500; 6d, $1,000.

Boeing Airplane Co., alternate bid, item 1a, 8,500 ea.; lb., $1,500; 1c, $1,000; 1d, $2,500; 1e, $21,250; 2a, $13,650 ea.; 2b, no charge; 2c, no charge; 2d, no charge; 3a, $14,000; 3b, no charge; 3c, do; 3d, do; 4a, $12,800; 4b, no charge; 4c, do; 4d, do; 5a, $3,333.33 ea.; 1b. no charge; 5c, do; 5d, do; 6a, $30,000; 6b, $5,000 6c, $2,000; 6d, $3,000.

Curtiss Aeroplane & Motor Co., Inc., Garden City, N. Y., item 1a, $11,900 ea.; 1b, $1,000; 1c, $500; 1d, $200; 1e, $29,750; 2a, $12,900 ea.; 2b, $750; 2c, $200; 2d, $750; 3a, $19,700; 3b, $2,000; 3c, $800; 3d, $1,200; 4a, $20,200; 4b, $750; 4c, $200; 4d, $750; 5a, $4,400 ea.; 5b, $200; 5c, $200; 5d, $500; 6a, $50,000; 6b, $4,000; 6c, $2,000; 6d, $8,000.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

A Light Plane Book at Last

The most important book on light planes that has yet been written has recently arrived from the press.* It comes as a refreshing stimulus in a field where there has been so much confusion and dissention, where countries and individuals alike are in disagreement as to objective. Here, in this work of Langsdorff's, is laid down in clear analytic form the whole *raison d'être* of light plane beginnings, development, and possible future trend.

Dr. Langsdorff's viewpoint is that of the engineer. He is a scientist as well as a practical constructor and flier; and so he sees, for he has wrestled with, the problems of each. He looks upon the development of low-powered aircraft as the only path upon which an economically stable air traffic may come.

How Progress Came

The motorless flight efforts of Germany, France, England and the United States of 1920-23 were expressions of a desire toward economy of effort, and while gliding flight has not yet been entirely successful, still very great progress has been made. It is a long distance, aerodynamically speaking, from the crude structures by means of which we tried to glide in 1920—machines which had all the marks of 1908 about them—to the ships entered in the Rhön competition of 1924. This progress is in the direction of increasing *L/D, or what one* speaks of as "efficiency." Dr. Langsdorff was a worker on these machines and shortly after the Rhön Meet of 1922, he became interested in the application of the glider experience to light plane development. In March, 1924, he made a flight of 70 mi. with Schrenk on the Daimler L15 which was described and illustrated recently in AVIATION. The flight was an achievement in efficient and practical travel: a 9 hp. motor furnished the power to carry two persons on a cross-country flight. How far Dr. Langsdorff was responsible for the development of this machine, we do not know, but it is quite certain that in analysing the factors entering into problems of design and clearly stating the aim to be sought in light plane development, he possesses ample ability.

The book begins with just such an analysis which the author calls, "Over-motored, motorless, and low-powered flight." It then proceeds to a discussion of the development of the light plane, the problems involved in its design, and finally in the construction of its parts. The major portion of the book is devoted to this structural design and details of building lifting surfaces, controls, fuselage, landing gear, and bracing. At the end there is a section dealing with examples of construction, a compendium of great value and more comprehensive than any of the kind seen so far. Altogether the book is well laid out, and one's only wishes are that it might contain some simple strength calculations for the amateur builder and that it could be translated into English so that its American field of usefulness might be wide.

Striving toward greater Efficienecy

This department of AVIATION is constantly in receipt of letters from its readers asking for information which cannot be given because none is available in suitable form for such distribution. There are but a few books dealing with light plane design and construction, and such as there are seem too technical for the average reader. Here is a book that might fill this demand satisfactorily.

One of the most interesting sections of the book is that containing the analysis, which begins with a very general statement. "The impulse to find an economical means of work performance lies deeply grounded in mankind. The fundamental principle of all human conduct has always been, whether consciously or unconsciously, the attainment of specific aims by means of the least possible effort." Langsdorff then takes up the general subject of transportation, and finds that the reduction of friction is the deciding factor in its development, for it means a possible decrease in driving power or an increase in speed or in load carried.

Proceeding, he points out that for the first attempts at flight, which were undertaken to prove its possibility, a surplus of power was necessary. Then came the pressure of the war, where a maximum performance was necessary. Aerodynamic refinement was not then so generally understood to the degree it is today. And here is another surprise which might queer the book with some who differ in their ideas of flying. "It is not desirable to increase performance to so great an extent. It may, perhaps, be to the point to decrease it in the future. For an airway plane we may have need of but a 12,000 ft. ceiling and a speed only enough greater than rail traffic so that passengers have a real advantage." He suggests double the speed of fast trains and three times that of fast steamers. "Far more important," he says, "is it to decrease cost of operation. It can hardly be doubted, from the experience of the air lines, that an increased economy can be achieved by slightly decreasing performance. With that would come a cheapening of air travel with far greater increase in the number of patrons than that to be looked for by an increase in speed."

Decrease Power Requisite for Flight

The keynote of this section of the book is "economic practicability," which should be the aim of traffic aircraft development. "It would be advisable to strive with every possible means to decrease the power requisite for flight. With a fraction of the power used today, one must attain in the future the same pay load traffic."

The author then develops his thesis of light planes as influenced by both motorless and "over-motored" airplanes. He says, "It was the desire for aerodynamic refinement, and, at the same time, for economic practicability that resulted in the re-vitalization of glider experimentation. Even though we may not believe in the goal of motorless flight: the pure (soaring) flight of man, the results of the glider experiments have been entirely satisfactory." One can see how far the glider influence has penetrated into German life both in the larger as well as in the more restricted technical sense. "The practical use of motorless craft is limited if the flight must be discontinued with the dropping of the wind. The idea of fitting auxiliary motors in gliders to make possible continued flight over quiet regions, grew up in the first Glider Competition. Such a craft may some day become a practical means of travel, but above all it will be a cheap sporting plane. However, even for purposes of experimentation and research, a glider would be helped by a small auxiliary motor, especially in experiments with dynamic soaring.

"It is well to emphasize that glider flight possesses now as before a high degree of interest," says Langsdorff.

Small Motors or Large Motors?

"The scientist will put the research problem in the foreground. He will aim at a craft with a very small motor without regard to the fact that the buyer does not want a machine which needs external help in starting. The constructor will be inclined to allow an increase in motor-power in order to obtain a greater performance. All types of machines were used at the Rhön Competition: motorless machines, auxiliary motor gliders and light planes. The motors used range from the 1¼ hp. auxiliary motor to the 30 hp.

*Das Leichtflugzeug. By Werner v. Langsdorff (H. Berhold Verlag, Frankfurt a.M., 1924.)

Douglas. As a rule, however, the motors used in Germany have been under 15 hp.; in other countries they have been greater than 15 hp. This indicates that the way in which constructors in Germany have gone from over-motored, by way of motorless, to low-powered flight has not been comprehended in all its implications." In England, the United States and France there is a marked tendency to proceed in the direction of increased motor power. To continue on this path will mean a loss of all that might have been gained from the glider experiments. *"An increase in performance of light planes, forced by means of increasing motive power signifies no progress."* Progress is a matter rather of the most far-reaching refinement, both aerodynamically and structurally. That there is much to be done that is both interesting and promising, has been shown by glider experiments.

Langsdorff returns again to the matter of high performance and low power. He insists that a high performance craft is useless for peace purposes and may claim solely a demonstration value or military use. The contemporary light plane, in countries other than Germany, is in the upper range of horsepower allowable to the type as it is defined by usage. The successful English machines at Lympne (1923) were equipped with motors developing from 18 to 20 hp. These English tests are by no means a new performance, since already before the war we had flown with smaller motors. Even after the war, similar performances were achieved with motors of the same size. The Riesler monoplane is a machine giving such a performance with a motor of the same size; however, the Riesler can not be regarded as a light plane since in neither its design nor its construction was the knowledge gained in the glider experiments employed. We note here how Dr. Langsdorff is still making progressive use of the data of the gliding experiments, withholding the premature demand for immediate practical use, in order to secure greater engineering economy, and in the end, a far greater practicability. Our demands are impatient of such scientific standards. "We must note," he says, "that a single-seater of 20 hp. can hardly be regarded as a low-powered craft. Even for a two-seater, this power is too high."

An Interesting Program

It is certainly a wonderful bit of success on the part of the motor manufacturer to obtain 18 to 20 hp. from a motor of but 500 c.c. displacement, or 30 hp. from a motor of 750 c.c. displacement. Successes obtained with such motors are, however, motor successes, not light plane successes. It certainly is not a matter to be underestimated if one succeeds in developing high-powered motors which with the same fuel consumption have more power than motors used heretofore. The perfection of motors, however, is not to the point, and light plane perfection cannot be considered as having been achieved with this motor improvement.

Those who are framing the Rules for the 1925 Competition might find Dr. Langsdorff's suggested light plane competition program of interest. He says: "One should decide first upon a definite minimum performance that must be demanded if the light plane is to be considered practical. The future development should then be first of all with reference to economic practicability. There should be contests in which this minimum performance is to be achieved with the least possible horsepower. Those directing the competitions should then decrease the maximum power allowable from contest to contest according to the progress shown. It would be useful in such contests to test the peak power of the motors. In this way one might foster with prizes the attainment of high peak power combined with low displacement. Every increase in horsepower over the established maximum would be penalized. The prizes would be given for the achievement of the required minimum performance with the lowest displacement and the lowest peak power."

The determining factor in this sort of directed development would have to be the practical use of the craft. One cannot therefore, dispense with a certain excess power, but if there is to be progress in the development of the light plane, it must be guided in the direction of motorless rather than in the direction of over-powered planes.

Dr. Langsdorff does not agree with the point of view expressed by Von Lachman that "the sort of very small motored craft like the 'Wren,' whose motor has a peak performance of 10 hp., has only a demonstrative or historical value without being a *Gebrauchsmachine.*" He says that single seaters with 750 c.c. motors which have a peak power of 30 hp. have as light planes only a very limited significance. Instead of encouraging the development of such craft, he urges that it is more advantageous to develop those with 200 c.c. motors which give 10 hp. Von Lachman suggests 1500 c.c. motors for two seaters, reminding us of the new English plans and our own single-seater limit. Dr. Langsdorff points out, however, that motors of this size can be built to develop well over 40 hp. and that such two-seaters hardly indicate progress, since flights were made years ago with two persons on less power. To show that two-seater flights on less power are not impractical and are not to be considered only in the nature of good weather performances, Lachman calls attention to the recent flight of Schrenk and Klemm on the Daimler L15 with a 9 hp. motor. It is just such development of light two-seaters that ought to be pushed. It is two-seaters that will be in demand in light planes as in motorcycles and sport automobiles.

Today's Opportunity

The problem and the opportunity today is to develop the light airplane, and not merely to take light flying craft and give them the name of light planes. The tendency to go in the direction of the wrong kind of light craft is recognizable not only outside of Germany, Langsdorff says, but in Germany as well. A progress that is to be not merely advertising material is to be expected only when old viewpoints are thrown overboard.

The book offers a great many examples from all types of light planes, including all the small machines in the history of motor flight. Each is illustrated. The reader will find in many of the small sketches valuable information for detailed construction. Light plane motors are dealt with in this section only incidentally to the plane in which they are used. Several of the American light planes are described and illustrated. Some of the most prominent French machines that are still considered as being of the light plane class, are also considered. As a handbook for the amateur builder this section of "Das Leichtflugzeug" is very useful indeed.

New N.A.C.A. Report on Light Planes

The report on English single-seater light planes which the National Advisory Committee for Aeronautics published this summer received such an enthusiastic response from the readers of AVIATION, who swamped the office with requests for copies of it, that a new one has been prepared covering the two-seaters which participated in the contest held at Lympne, England, Sept. 20 to Oct. 4, 1924.

For those who do not read *The Aeroplane* and *Flight*, the two British magazines from which this material was taken, this report will be found to be very useful. We hope shortly to publish a more complete review of this report. Until that time, those who wish to know more about the report may obtain a copy by writing to the National Advisory Committee for Aeronautics, 3341 Navy Building, Washington.

AVIATION
wishes its host of readers
a happy and prosperous
New Year

AIRPORTS AND AIRWAYS

Hadley Field Opened

Hadley Field, the new eastern terminus of the transcontinental Air Mail was opened on Dec. 15 with the dispatch at 9:45 a. m. of the first westbound mail plane; and with the arrival at 11:45 a.m. of the first mail plane from the West. Hadley Field is about five miles from New Brunswick, N. J.

Mail brought from New York City via Pennsylvania Railroad express was sent to the field in motor trucks, loaded into a plane, and pilot James Hill hopped off, bound for Cleveland, with Bellefonte, Pa., as the first stop.

Pilot Paul Collins brought in the first mail from the West.

Payroll by Airplane

Among the diversified work that comes to the Curtiss Exhibition Co. of Garden City, there was recently the weekly transportation of a $5,000 pay roll by airplane to New Market, N. J. The money was forwarded by the Spaulding Construction Co. for its employees who were building the hangars at the Hadley Field.

The money was carried in a Curtiss Oriole piloted by Casey Jones, who was accompanied by William E. Arthur of the construction company, and Howard D. Ingalls, of the Air Mail. All three men were armed to forestall the possibility of a holdup. The Spaulding company considered it safer to carry the money by air than by automobile.

Cincinnati News

By E. F. Marsh

Pilot Roy McWalters and Walter Winkenbaugh, have returned from Washington, D. C., where they were looking after business for C. E. Lay, the local aircraft designer, who is at present engaged on working out some new designs. Mr. Lay has been very ill for the past ten weeks, but is on the road of full recovery. It is reported that the McMinnies brothers have purchased all of Mr. Lay's designs.

Much comment can be heard in business circles on the proposed U. S. Airways System. It is particularly noted that Cincinnati does not appear on it. Just who is to blame for this, the Chamber of Commerce is unable to tell. Officers at Grisard Field have no comment.

Nine ships in a flock, including species of every age, stopped in several lots on Turkey Bottoms recently, gassed up, fed up, and proceeded for different destinations southward. We hurried out but were only able to interview one Ray Bennett of Toronto, Canada, the last to take off. Mr. Bennett hoped to do business in some of the southern ports this winter, returning to the northern resorts next spring. He is flying a Canuck, and has it in fine shape.

Air mail business out of Cincinnati is reported good. If there is anything in hustle, surely the stamp window attendants at the postoffice have done their part. Street boxes have been placed in several sections and the dailies have carried headlines boosting the Air Mail.

Denver News

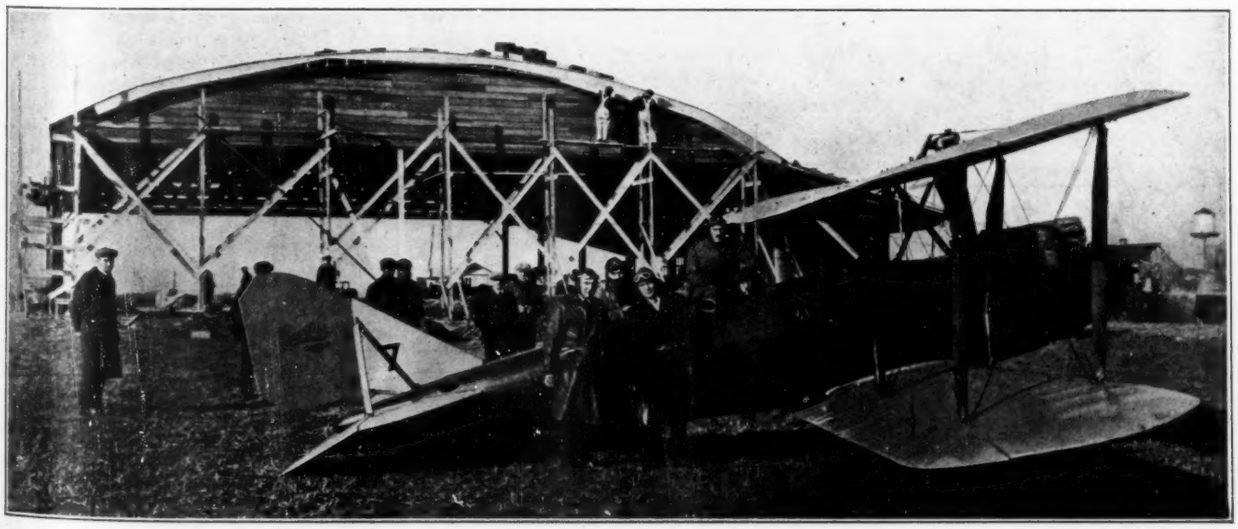
By Geo. F. Choate

At the present time nearly all the flying activity in Denver, Colo., is carried on by the 120th Observation Squadron, 45th Division Air Service, Colorado National Guard, with Maj. William H. Dayton in command; Capt. M. G. Robinson is Operations Officer.

This squadron has nine ships and is functioning regularly and smoothly. Since June first of this year about 900 flying hours have been put in, with no injuries or deaths to any of the personnel, which number about one hundred and twenty-five officers and men. They are operating on their own airdrome, known as Lowry Field, named, according to Air Service custom, after an aviation officer who was killed flying in France: Francis Brown Lowry.

The field is in excellent shape and is about three-quarters of a mile square. It is exactly one mile above sea level, and has the distinction of being the highest, regularly established airdrome in the United States, and to our knowledge in the world. It lies northeast of Denver and is clearly marked by two standard type hangars which have, "Lowry Field, Denver. Altitude 5,280 feet," painted in white on their tops.

Maj. William H. Dayton, pilot, and Capt. J. H. Cordner, observer, of the 120th Squadron, carried off first honors at the annual aerial gunnery meet for National Guard units at Bolling Field last October.



P. & A. Photos

The Curtiss Oriole which carried a $5,000 payroll to Hadley Field—Casey Jones, the pilot, is seen standing in the cockpit; in front of the plane are W. E. Arthur and H. D. Ingalls

New World Records

The National Aeronautic Association has just received notice from the Fédération Aéronautique Internationale that new world records for air planes and seaplanes, established in accordance with F.A.I. regulations, have been recognized by that body as follows:

CLASS C—(AIRPLANES)

With useful load of 4000 kg. (8818.48 lb.)

Altitude

Lieut. H. R. Harris, U.S.A.S., and Mechanician Doug. Culver, Barling Bomber, 6 Liberty, 400 hp., at Wilbur Wright Field, Dayton, Ohio, Oct. 3, 1924— 1363 m. 4472 ft.

Duration

*Lieut. H. R. Harris, U.S.A.S., and Mechanician Doug. Culver, Barling Bomber, 6 Liberty, 400 hp., at Wilbur Wright Field, Dayton, Ohio, Oct. 3, 1924— 1 hr. 47 min. 10.5 sec.

With useful load of 1500 kg. (3306.93 lb.)

Altitude

Lieut. J. A. Macready, U.S.A.S., Curtiss (Martin) Bomber, NBS1, 2 Liberty 400 hp., at Wilbur Wright Field, Dayton, Ohio, Oct. 2, 1924— 4953 m. 16250 ft.

Duration

†Lieut. J. A. Macready, U.S.A.S., Curtiss (Martin) Bomber, NBS1, 2 Liberty 400 hp., at Wilbur Wright Field, Dayton, Ohio, Oct. 2, 1924— 2 hr. 13 min. 49.6 sec.

Examination for Junior Aero Engineer

An examination for junior aeronautical engineer will be held throughout the country on Jan. 21, 1925. It is to fill vacancies in various branches of the Government service, at an entrance salary of $1,860 a year. Advancement in pay may be made without change in assignment up to $2,400 a year.

Applicants must have been graduated with a degree in engineering, preferably aeronautical engineering, from a college of recognized standing, or must be senior students in such course and furnish proof of actual graduation within three months from the date of the examination. Applicants who have completed two full years of engineering study in a college of recognized standing, may substitute for each additional year of the formal educational requirement a year of aeronautical engineering experience.

The duties of the position are to perform such work as routine testing, performing field work, making computations, assisting in conduct of experimental research tests, compiling reports, handling technical correspondence, and other related work.

Competitors will be rated on general physics, pure mathematics, practical questions in aeronautical engineering, and education, training, and experience.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or customhouse in any city.

Austrian Air Services

Aviation in Austria has been developing rapidly during the last few years aided by a keen interest on the part of the general public, Consul C. H. Foster Vienna reports to the Department of Commerce. Austria's strategic central position in Europe has aided greatly in this development and undoubtedly ensures an increased activity in the future.

Several companies are operating regular air services from Austria to the principal cities of Europe. The Compagnie Franco-Roumaine de Navigation Aérienne has established a route from Vienna to Prague and Paris, and to Budapest and Constantinople. The Hungarian Air Traffic Co. operates between Vienna and Budapest. The Oesterreichiesche Luftverkehrs A. G. (Transeurop a Union) operates between Vienna and Munich, connecting with a Munich-Zurich-Geneva line and with the Munich-Berlin line; it also operates a seaplane service between Vienna and Budapest.

Austria has four landing fields to and from which mail and passengers are transported by automobile: the Jedlesee and Aspern fields near Vienna, the Thalerhef field near Graz, and the Annabiehl field near Klagenfurt. The last three are controlled by the Federal Ministry for Commerce and Traffic, but only the Aspern field is used to a large extent. The Jedlesee field, situated on the banks of the Danube, belongs to the Oesterreichische Luftverkehrs A. G.

Air traffic to and from Vienna during the first ten months of 1923 accounted for 1,538 flights and carried 2,361 passengers and 46,720 kg. of mail and merchandise.

Development of Danish Air Traffic

The development of commercial aviation in Denmark has gained considerable impetus during the past two years. Commercial flying in that country was first attempted in 1919, but regular air transport was not put into operation in Denmark until 1923. In that year the Government granted a subsidy to the Danish Air Traffic Co. for the maintenance of its service from Copenhagen to Hamburg. During the six months' flying period of 1923, 94 per cent of the trips were successfully completed, and 414 passengers, 5½ tons of goods, and 600 kg. of mail were carried.

The company now operates, in conjunction with a German and Dutch company, a regular service, twice daily, between Copenhagen and Hamburg, and a daily service between Copenhagen, Amsterdam and Rotterdam. In addition to the tourist traffic many business men are taking advantage of this rapid means of communication between European centers.

According to present plans, the Danish Air Traffic in April, 1925, will double its services on both the Hamburg and Rotterdam routes. Experiments in night flying are now being made with a view to ascertaining the practicability of such flights from Copenhagen to Berlin, via Stettin. If these experiments are successful, regular night services will be established.

Sweden Fosters Commercial Aviation

Commercial aviation in Sweden will receive a new impetus from two important steps which have just been taken. One is the recommendation by the Royal Board of Trade that the Government establish a fund of 2,000,000 kronor (about $563,000) for the promotion of air traffic, and the other is the decision, just announced, to build an airplane factory at Malmoe.

Malmoe, which also expects an appropriation from the Government, thus becomes definitely the aviation center of Scandinavia. It is the junction of Swedish air lines from Hamburg and Copenhagen.

A Swedish company has recently established a new air route between Malmoe and Copenhagen, Denmark. In contrast to the ferry trip across the Sound, which takes about two hours, airplanes cover the distance in ten minutes. Usually three trips are made daily in each direction, but on special days as many as thirteen trips have been made. During the first two months of operation 1,300 passengers were carried over this route.

A competing route was established by another Swedish company during the summer of 1924. The planes of this company fly between Malmoe, Hamburg, and Rotterdam, passing over Copenhagen and landing there if there are more passengers for Hamburg and Rotterdam than the Danish planes can carry.

Round Japan Seaplane Flight

A 2400 mi. flight around Japan in nine days was accomplished last July by the Japanese aviator Goto on a Haruzako seaplane fitted with a Japanese built Hispano-Suiza engine. The flight was made for a prize given by a daily paper of Osaka. The itinerary of the flight was Osaka-Kagoshima-Fukuoka-Kawazawa-Hachirogata-Minato-Kasumigaura-Osaka.

This is the longest flight so far made in Japan with the same plane. The longest previous flight was made in 1921 by Lieutenant Higuchi, who flew on a Salmson observation plane from Tokio to Changchum, Manchuria, covering 750 mi. in two days.

*In accordance with Art. 198, F.A.I. Regulations this is also a world record with 2000 and 3000 kg. useful load.

†This is also a world record with useful load of 1000 kg.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Plane Hooks and Unhooks Airship

The double feat of an airplane hooking itself on to an airship while both were in flight at an elevation of 1,500 ft., and then freeing itself to sail away, was accomplished for the first time at Scott Field, Belleville, Ill. on Dec. 15.

The ship used was the Army airship TC3 and the plane was a Messenger. A metal hook, attached to a frame over the center section of the plane, was used to catch on to a small

The U. S. Army Messenger plane which Lieut. Clyde Finter (leaning against skyhook) successfully hooked and unhooked on airship TC2

trapeze, swinging from cables slung under the bombing rails of the airship, as shown in the cover picture.

Lieut. Frank McKee had charge of the TC3 and Lieut. Clyde V. Finter piloted the Messenger plane.

This successful experiment marked the culmination of a series of tests these two officers have been conducting for the past two months.

Interesting information on a previous hooking and unhooking test made by the same pilots at Wilbur Wright Field is contained in a report by the commanding officer at Scott Field, which reads in part as follows:

"In preparation for the experiment the airship was trimmed horizontal, carrying 150 gal. of gasoline. The attaching device, or trapeze bar which was secured to the bomb racks and extended about 9 ft. below the car, was attached while the ship was in the mooring mast. After maneuvering the ship to the flying field, it was weighed off about 1,200 lb. light, the engines were warmed up and the trapeze bar was dropped into position and secured. The plane was then maneuvered alongside the car, the airship allowed to rise and then placed in position over the plane. Quite a bit of difficulty was experienced in this operation owing to the fact that it was almost impossible to keep the airship under control and to avoid injuring the plane when the airship was forced down due to gusts and eddies. Some slight damage was done to one wing of the plane, but this did not affect its operation in any way.

"As soon as the plane was hooked on, the order was given to let go and the airship free ballooned about fifteen or twenty feet before the engines were opened up. No difficulty was experienced from then on. An altitude of about 150 ft. was maintained for the full length of Wilbur Wright Field and then a climbing turn was made until the airship reached an altitude of 1,500 ft., and it was then headed directly into the wind and the engines were opened full throttle.

"During the climb to the predetermined altitude, Lieutenant Finter in the Messenger plane had started his engine. It had been agreed by both pilots before taking off that the airship would be taken to an altitude of 1,500 ft. and headed directly into the wind at full throttle. It was also arranged that Lieutenant Finter would swing off either to the right or to the left immediately after releasing from the airship in order that, if necessary, the crew could nose the ship down at a steep angle with no possibility of striking or interfering with the plane in any way."

The actual launching of the plane is described by Lieutenant McKee in the following terms:

"We had no prearranged signal for letting go other than for me to let him know when we had reached 1,500 ft. This I did, and shortly after Lieutenant Finter released the plane. I did not realize that he was gone until I looked over the side and saw him about 100 ft. below and to the left. It was a matter of at least a minute before I felt the static effect of the loss of the plane. This was not particularly great owing to the fact that the motors were wide open. The ship did not gain altitude or become unmanageable in any way. At no time, either while carrying the plane or after its release, was any difficulty experienced in handling the ship. Lieutenant Finter stated that he at all times had perfect dynamic control of his ship and could slide it either to the right or left on the bar by a slight movement of the rudder and could use his elevators in elevating or depressing the nose of his plane."

Luke Field News

The following-named Air Service officers stationed at Luke Field, H. T., have been ordered, upon the expiration of their tour of foreign service, to proceed to the States on the December or January transport and report to the stations named: Capt. Richard J. Kirkpatrick and First Lt. Harry F. Colliver to Langley Field, Va.; First Lt. Orville L. Stephens to Middletown, Pa.; First Lieuts. Milo N. Clark and Henry H. Reily to Kelly Field, Tex.; First Lieut. John V. Hart to Chanute Field, Rantoul, Ill.; and First Lieut. Oscar L. Rogers to Maxwell Field, Montgomery, Ala.

Some of the missions of particular interest which have been flown recently include a special inter-island flight to Molokai, conveying Major-General Menoher, Department Commander, and his party; an all night search for the body of the Honolulu District Attorney who disappeared in the waters at Waimea while swimming at the west end of Oahu (he was never found); a special trip conveying Max. H. Carson, District Engineer for the Department of the Interior, to the Island of Molokai to procure an aerial view of a proposed footpath to connect two isolated Hydrographic stations. This mission was accompanied by Lieut. Roscoe C. Wriston, Photographic Officer, in the Photo Section's DeH. Lieutenants Wriston and Harris remained on the island several days accomplishing photographic work.

Air Orders

Special Orders 200, relating to First Lieut. Philip Schneeberger, A.S., amended to relieve Lieutenant Schneeberger from duty at Kelly Field, and to order him to proceed to San Francisco and sail on transport Jan. 3 for Hawaii.

Sec. Lieut. Charles C. Higgins, A.S. (Inf.), Brooks Field, to Fort Sam Houston.

Sec. Lieut. James C. Fry, A.S. (Inf.), Kelly Field, to Fort Sam Houston.

Spec. Orders 201, relating to Sec. Lieut. George Harvey Smith, amended to direct Lieutenant Smith to proceed from Boston.

Transfer of Sec. Lieut. Stephen Stanley Koszewski, A.S., to Field Art. announced. Lieutenant Koszewski to proceed from Brooks Field to Fort McIntosh.

Sec. Lieut. Fred Cassius Reed, A.S. Off. Res. Corps, Washington, to active duty, Washington, reverting to inactive status Dec. 19.

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U. S. NAVAL AVIATION

Coast-to-Coast Flight for ZR3

Proposals for a coast-to-coast flight by the air liner Los Angeles, formerly the ZR3, are understood to be included in suggestions under consideration by Secretary Wilbur. The decision, he said, depends on a study now in progress as to the necessity of releasing helium to get the ship over the mountains.

Rear Admiral Moffett has informed Congress that it is planned to send the Los Angeles to local points to try her out, after which she would probably be sent to Panama.

It is assumed that the projected trip to the west Coast would be regarded as a test flight to precede a pioneering voyage on a commercial route. Admiral Moffett has stressed the belief that "the best place for operating lighter-than-air ships is over water and not over land.

"In going over water they do not have to climb. They need only go about 800 ft. up, and therefore they will not have to valve helium."

Quick Photographic Work

A Naval F5L plane operating in connection with recent tests with the Battle Fleet off San Pedro, Calif., took an aerial photograph, developed it and dropped prints on board the battleship California. This is considered as something of a feat as it indicates possibilities in naval war-time operations, when valuable pictures could be obtained and delivered immediately from reconnoitering planes so that the ship's commander could get first hand knowledge of the situation.

Publisher's News Letter

"Dear Bill" or "Dere Mabel" is probably the way this letter should start. It is really a letter from Washington, where aviation seems to be discussed in every official building. The Christmas spirit seems to be remembering the flying fraternity at last—perhaps in some cases a little too much so, but the great and significant fact that stands out in every visitor's mind is that everyone from the President down is thinking aviation and wishing to give it a larger place in the affairs of the country.

Before we take you on a trip around the Capital it is not too late to send the season's greetings to the loyal and evergrowing group of readers who find in AVIATION a weekly account of aerial progress. Our efforts for 1925 will be directed toward making the year one of very pleasant and, we hope, profitable exchanges of aeronautical information. In this way we intend to contribute to the very happy and prosperous year that we hope all our readers will have. If present indications are true signs of the near future, Santa Claus has not forgotten his fellow air travelers. While Donner and Blitzen and Comet and Vixen are mingling their bells with the sounds of the fliers' engines, they seem to be carrying to the aircraft people of this part of the world a substantial hope for better things to come. In fact, some one has suggested that Santa Claus might be given a special place of distinction among fliers, he being the most successful and popular aviator the world has ever known. Perhaps some bright mind in one of the numerous Aero Clubs may pick up this very happy suggestion and enshrine St. Nick by appropriate inaugural ceremonies.

* * * *

But to get over to Pennsylvania Avenue and start a visit to the various places where aviation is being considered. The beautiful dome of the Capitol is at this time the focal point toward which all efforts lead. From a comfortable seat in the House Gallery we hear long discussions on the floor on governmental aviation. Almost a whole session is being devoted to the Air Mail. It is encouraging to hear Congress discuss aviation with vehemence instead of letting it go along unnoticed. Maj. F. H. La Guardia, Representative from New York, and the only aviator in Congress, has succeeded in getting two Air Mail bills out of Committee and on the calendar. It has not been generally known that the Air Mail has been run by the Post Office Department with little more authorization than that given by an appropriation. As a result, any member of Congress might have raised a technical objection at any time with serious results—as has happened before. Major La Guardia's bill not only legalizes the Air Mail, but permits the Postmaster General to extend the Air Mail—which is now limited to a direct route from New York to San Francisco—to any other place or to establish new routes. After vigorous discussion it passed the House and has an excellent chance of passing the Senate. It will mean a great step forward to have these extensions made possible.

* * * *

The other bill that Major La Guardia piloted through bumpy air was the Kelly bill which authorizes the Postmaster General to make contracts with civilian pilots to operate Air Mail routes on specific terms. Four-fifths of all the receipts may be given to civilian operators as well as other arrangements that require authorization by law.

At this time of the year when the Air Mail is encountering its worst weather conditions, and is having its schedules seriously disarranged, this great vote of confidence from Congress will be appreciated. With trains snowbound, blizzards sweeping across the country, wire service crippled and roads made impassable by snow, the Air Mail pilots are winging their way through, over or under, the adverse weather conditions and keeping the airman's faith.

* * * *

At the Capital also the appropriations for the Army, Navy and Post Office are proceeding to their final presentment. The Budget Bureau and the Departments have presented the government's aviation needs to Congress and very soon there will be enacted, it is hoped, a series of appropriations that ought to give aviation in this country an impetus it has long needed. President Coolidge gave $65,000,000 as the total amount the Government is spending on air activities. Others place the figure nearer ninety millions. At any rate the campaign of AVIATION to get some idea of the combined costs has had its effect. Everyone is talking costs. Out of it must come a truer conception of values received and overheads wasted.

* * * *

Across the way two very important hearings are going on. The Winslow Bill is being considered in one room while the Air Service Investigating Committee is meeting in another. Let us look in on Congressman Winslow first. Here is the Secretary of Commerce telling the Congressmen that he believes that there should be regulation of aircraft and pilots. He says that he believes a civilian department should handle it—not the military. He quotes the well known statistical compilations to show the extent of aeronautical activities. It was

Publisher's News Letter

a surprise to some that he favored regulating aircraft when he had just decided that radio was too young to be similarly directed. After Mr. Hoover had finished representatives from the Army, Navy, Post Office, Agriculture, Treasury, and Labor all appeared and offered comment on the provisions of the act. All seemed to favor it. Then others spoke—all except those who were to be regulated, the producers of aircraft and the pilots. The combatitive and determined Mr. Dickinson of Chicago, who with Mr. Godfrey Cabot can rightfully be called the deans of aviation, was given only five minutes to oppose the bill. Right there we decided that any influence we had would be used toward securing a postponement of action this session and until the pilots of this country could be heard from. The present haste appears to be the result of Mr. Winslow's desire to have the bill bearing his name pass before he retires from Congress on March 4th. We do not believe that any bill should pass until the persons most interested have had a fair opportunity to be heard. These hearings were called so suddenly that it would have hardly been possible for pilots in the Middle West to be heard. In fact, even the aeronautical press was not notified. So, regardless of our opinion as to the merits of the bill, we suggest that you write your Congressman and Senator giving him your opinions on the provisions of the Winslow Bill and urging that the enactment of it be left until next session.

The Lampert Committee which is investigating the air services of the government has started to lay a foundation for its real investigation. The heads of the services have been heard and given their constructive suggestions. The publisher of AVIATION was asked to give the Committee his recommendations and of course he used the suggested National Air Policy as a basis for constructive comment. The personnel of the commitee are exceptionally keen and they seem to be very sincere in their efforts to find a way out of the present situation that aviation finds itself in. One of the witnesses, General Mitchell, raised the probable cost figure that AVIATION has been using from sixty-five to seventy million dollars to ninety millions a year or over four hundred million dollars since the War. This was gratifying as it was not based on guess work but a detailed tabulation.

When the Lampert Committee was appointed it was thought by some that it would make its chief effort in the direction of tracing some of the ever recurrent charges of favoritism, incompetence and waste that are made so freely by discredited persons. While these individuals will be given an opportunity to air their woes, the main purpose seems to be to formulate a workable air policy for the government. The testimony given at these hearings will be in printed form by the time this letter reaches our readers. Anyone desiring a copy may secure it by writing to Hon. Florian Lampert, House of Representatives. It makes the best reading on aviation that can be found. Unfortunately it is too voluminous to print adequate extracts from even in AVIATION.

* * * *

The General Board of the Navy has concluded its hearings. We understand that over twenty-five hundred pages of testimony were received by the Board and that its report should be ready for the President by February.

One of the pleasantries that is being repeated in Washington is the remark of the wife of one of the prominent officials when she heard several venerable Admirals give their views on aviation:

"I thought we were through with coal burners."

The report of this board will probably mark a turning point in aeronautical history. If it indicates a real decision on the part of the Navy to give aviation its rightful position, then it will have the merit of being the first time this has occurred, but if aviation is still submerged under "adjuncts" and "aids" and other belittling characterizations and the "backbone" position of the battleship emphasized, then the fight for a separate air force will be on with renewed emphasis. Someone in referring to this "backbone" simile said, "Yes, the backbone does keep everything in a body stiff and rigid but who ever heard of a man being killed in battle by a backbone injury?"

* * * *

Finally, the President seems to be holding aviation in a very prominent place in his mind. What he thinks of the future of aircraft as a governmental defense instrument is apparent from his budget recommendations. But the ever recurring mention of aviation in his talks with newspaper men must indicate a very deep rooted conviction on his part as to the growing importance that it will play. Those who are looking for leadership in aviation can do no better than to turn their eyes toward the White House.

* * * *

There are many other happenings in Washington that could be written about but as any letter writer would say at this time of the year: "Well, we must stop now as there is that last Xmas shopping to do." Again, AVIATION extends the Seasons Greetings.—L.D.G.

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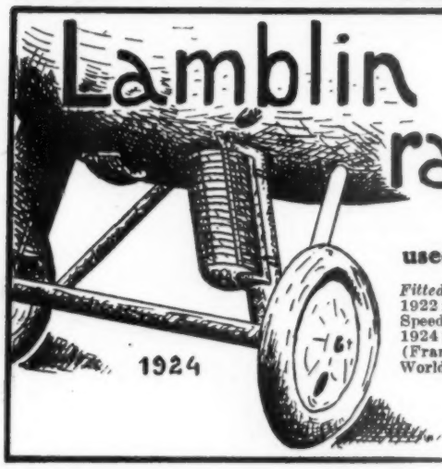

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The next few months will be full of interest for the flying fraternity

Is the airplane to continue as a mere auxiliary in the American Navy? Has the precept that the battleship is the backbone of the fleet undergone any modification in naval circles?

These questions and the numerous issues which they bring up are being discussed now by the General Board of the Navy at the President's direction. They will be answered in the report of the General Board.

The Lampert Committee, appointed by Congress to investigate the air services and decide upon a definite air policy for the United States is developing a fund of amazing information. Its recommendations will be the basis for government legislation which will vitally affect the future of American air power, military and commercial. What are we getting for our money? What may we expect to get?

Congress is now considering the new appropriations for Government aviation activities. The hearings of the Appropriations Committee will uncover matters of exceptional interest to everyone interested in the development of aeronautics. The Appropriation Act will show how our air power is to be built up.

The Winslow Bill, which will touch every pilot and commercial aviation interest, will again be presented to Congress. Everyone interested will want to follow the discussions and hearings on this bill.

This winter there will be heated discussions in and outside of Congress on the advisability of or necessity for a separate air force. Representative Curry of California has prepared a bill for a separate air force. The Army Air Service is for it. The Navy is against it and a brilliant display of fireworks is due.

The winter months are the time when aviation politics and policies are under discussion and in process of change. Everyone should watch this situation keenly. There will be no reason for anyone saying that "something was put over" if the people who will actually be affected follow closely the situation and make their influence felt at Washington.

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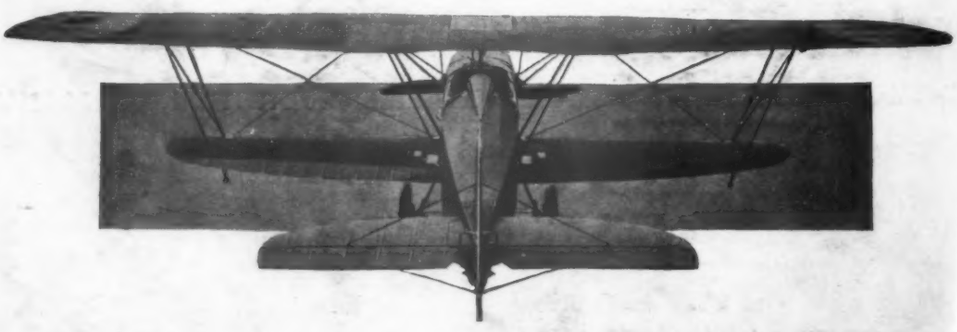
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